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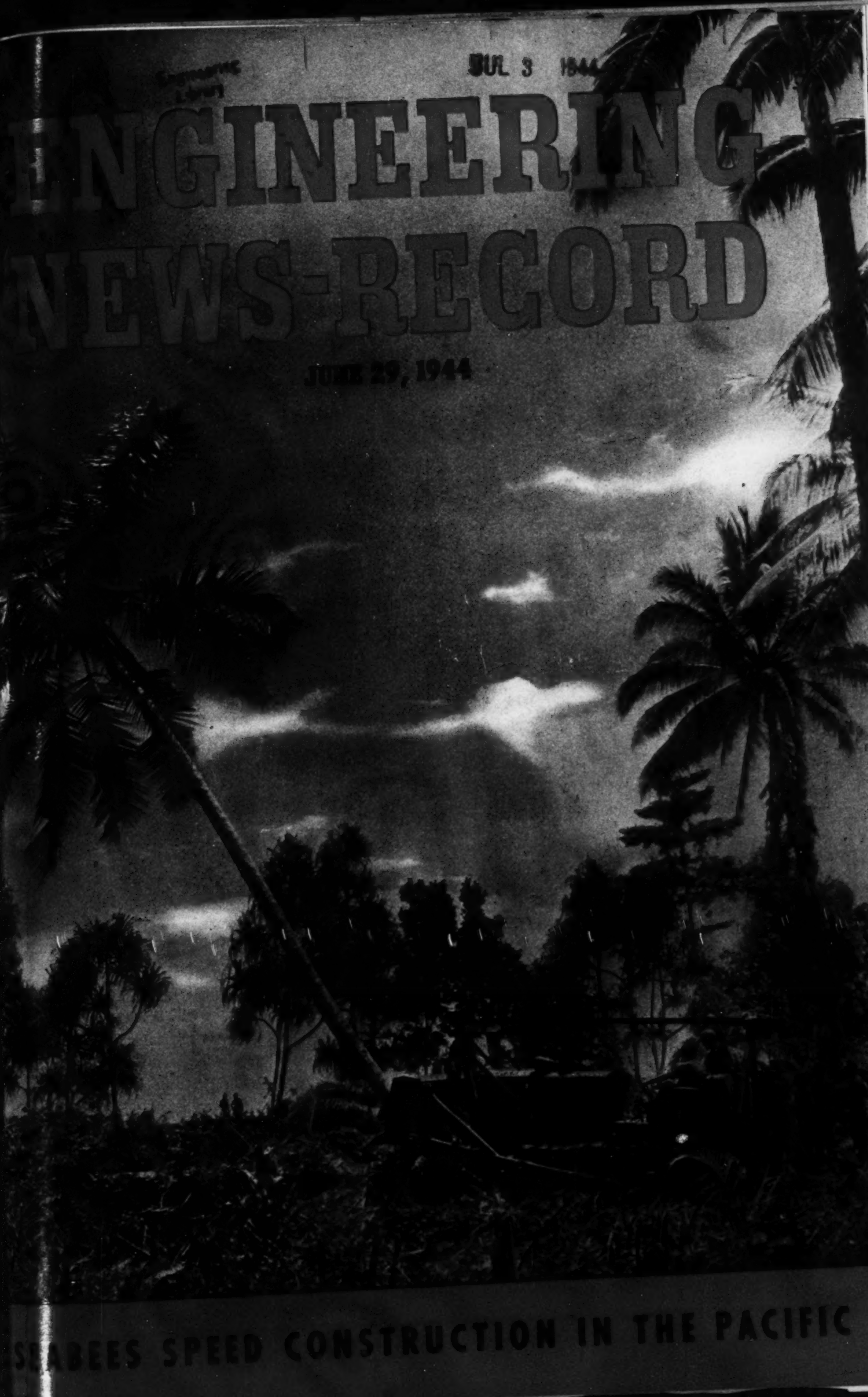
JUNE 29, 1944



SEABEES SPEED CONSTRUCTION IN THE PACIFIC

A 36" ARMCO culvert on the Alaska Highway between Teslin Lake and Whitehorse.

tough going on the "ALASKA"... BUT THIS PIPE CAN TAKE IT!

Sub-zero temperatures and icing, changing to mushy and muskeg foundations of the Yukon summer, are taken in stride by ARMCO Corrugated Metal Culverts.

These sturdy, flexible pipes were used by the thousands on the Alaska Highway construction to replace log culverts of the pioneer road. They are no strangers to tough service conditions. Not only on most of Canada's northern roads, but on the Richardson Highway and other Alaskan roads, ARMCO culverts have withstood the extremes of climate and soil.

Keeping ice-clogged culverts open is aided by open-flame heating equipment, to which the metal pipe is best suited. Fire-resistance, rust-resistance, strength, ease of transporting, and speed of installation are important features of ARMCO Corrugated Culverts. Soon they again will become available for civilian requirements. Include them in your post-war construction and maintenance plans. For further information write to: Armco Drainage Products Assn., Middletown, O.

★ ★ ARMCO ★ ★

Construction Trends

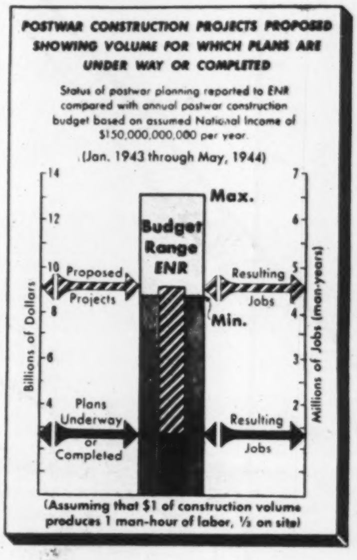
Postwar Highway and Bridge Construction

HIGHWAY AND BRIDGE projects proposed for construction in the postwar period total $2,272,350,000 for the seventeen months from January, 1943 through May, 1944—$1,722,222,000 in highways, and $550,128,000 in bridges. These two classes of work account for 25 percent of the $9,145,110,000 reported for postwar construction during the period with highways responsible for 19 percent and bridges for 6 percent.

Of the proposed highway volume, $706,204,000, or 41 percent has plans underway or completed. These planning stage highway projects are 27 percent of the $2,655,258,000 reported for all types of projects in the planning stage in the seventeen-month period.

Postwar bridge projects with plans underway or completed total $330,057,000, or 60 percent of the $550,128,000 proposed volume, the best percentage planning record of any class of construction. Bridge volume in the planning stage amounts to 12.5 percent of the *ENR*-reported for all projects with plans underway or completed.

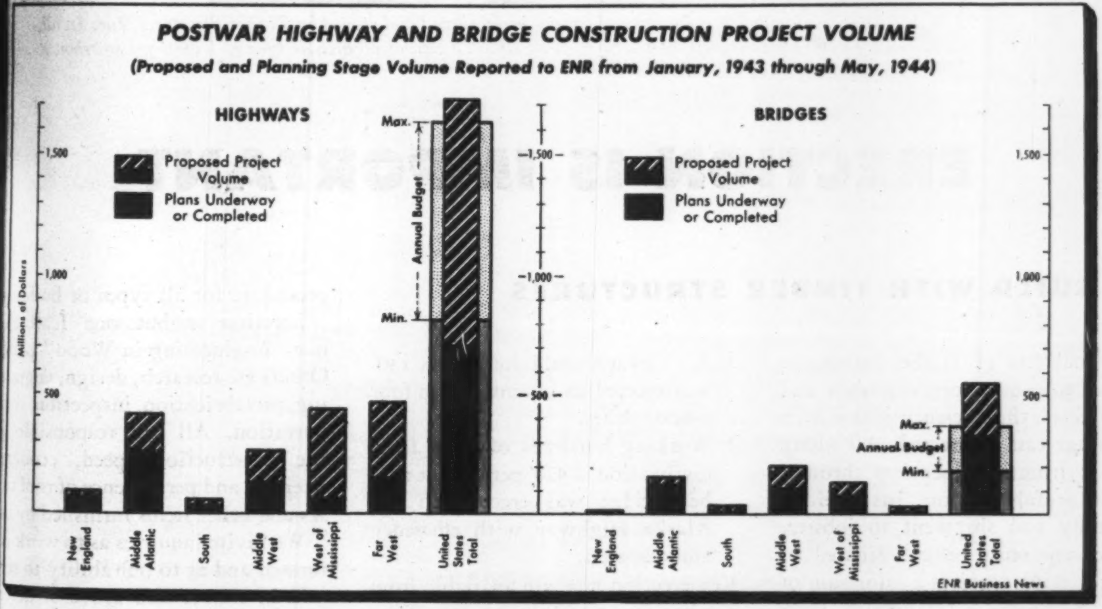
Both highway and bridge proposed postwar projects for the seventeen months exceed their maximum annual budget estimates. In the planning stage, however, highways are 13 percent below their minimum budget figure, and 57 percent below the maximum. Bridge projects in the planning stage top their minimum budget by 78 percent, and are within 11 percent of their maximum budget.


POSTWAR CONSTRUCTION PROJECTS PROPOSED SHOWING VOLUME FOR WHICH PLANS ARE UNDER WAY OR COMPLETED

Status of postwar planning reported to ENR compared with annual postwar construction budget based on assumed National Income of $150,000,000,000 per year.

(Jan. 1943 through May, 1944)

(Assuming that $1 of construction volume produces 1 man-hour of labor, ⅓ on site)


POSTWAR HIGHWAY AND BRIDGE CONSTRUCTION PROJECT VOLUME

(Proposed and Planning Stage Volume Reported to ENR from January, 1943 through May, 1944)

ENR Business News

GINEERING NEWS-RECORD. Published every Thursday. Return postage guaranteed. Vol. 132, No. 26. Price 25c per copy. Allow at least ten days for change address. All communications about subscriptions should be addressed to the Director of Circulation, 99-129 N. Broadway, Albany, 1, N. Y., or 330 W. 42nd Street, York, 18, N. Y. Subscriptions, United States, U. S. Possessions and Latin American Republics, $5.00 for one year, $8.00 for two years, $10.00 for three years. nada, $6.00 for one year, $10.00 for two years, $12.00 for three years. Great Britain and British Possessions 60 shillings for one year, 120 shillings for three years. other countries, $9.00 for one year, $18.00 for three years. Entered as second-class matter October 29, 1936, at the Post Office at Albany, N. Y., under the Act of rch 3, 1879. Printed in the U.S.A. Cable Address: "McGrawhill New York." Member A.B.P. Member A.B.C. Copyright 1944 by McGraw-Hill Publishing Company, , James H. McGraw, Founder and Honorary Chairman; James H. McGraw, Jr., President; Howard Ehrlich, Executive Vice-President for Business Operations; John bink, Executive Vice-President for Editorial Operations; Curtis W. McGraw, Treasurer; Joseph A. Gerardi, Secretary; J. E. Blackburn, Jr., Circulation Manager. lication office: 99-129 North Broadway, Albany, 1, N. Y. Editorial and Executive Offices: 330 West 42nd St., New York, 18. District Managers and Branch Offices: d G. Hudson, 520 N. Michigan Ave., Chicago 11; 738-9 Oliver Building, Pittsburgh; J. W. Otterson, 68 Post St., San Francisco, 4; Aldwych House, Aldwych, don, W. C. 2, England; Washington: J. M. Spackman, New York; A. B. Cozzens, Philadelphia; E. E. Duff, Jr., Cleveland; B. F. Horn, Detroit and Chicago; hard Y. Fuller, St. Louis; R. N. Phelan, Los Angeles; J. I. Ballard, Boston; Ralph Maultsby, Atlanta, Ga.

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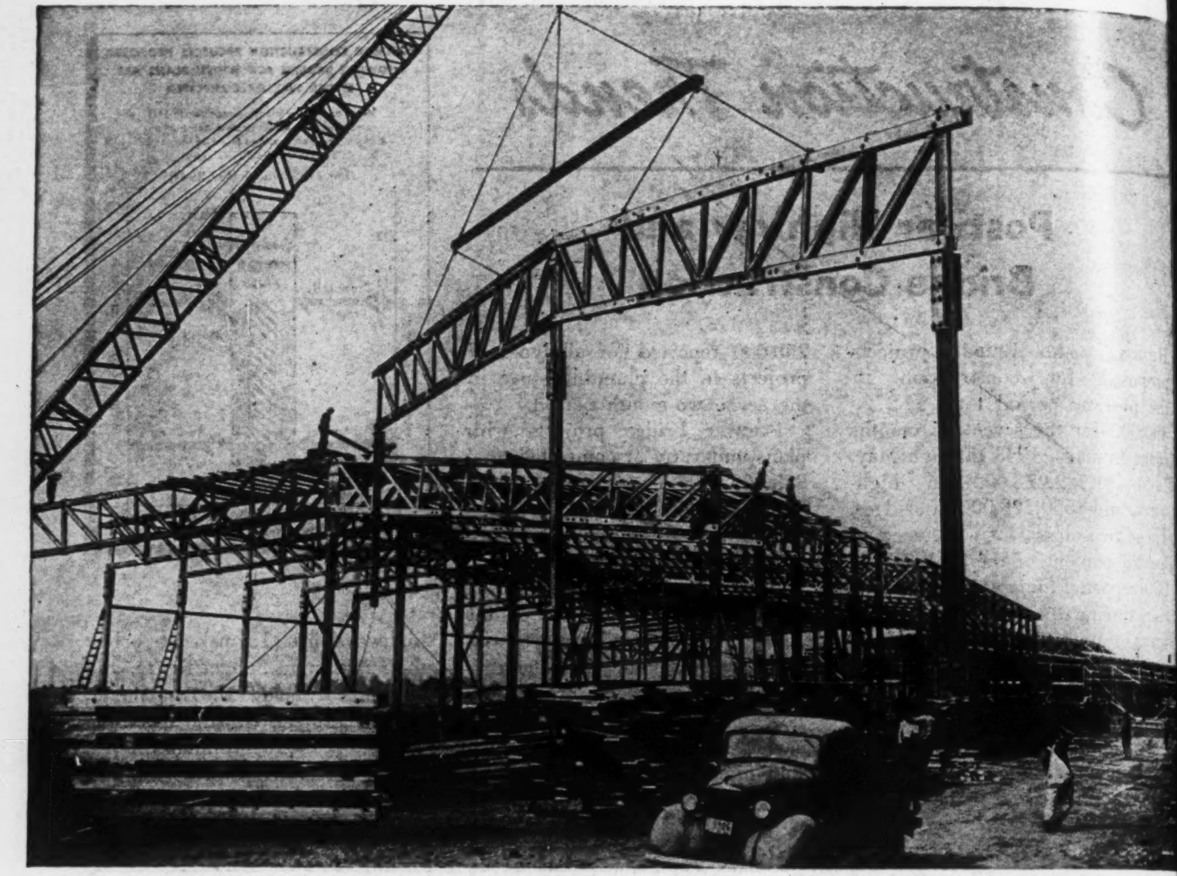


★ ★ *ARMY WAREHOUSES with 2,304 flat top roof trusses prefabricated and erected by Timber Structures, Inc. In all, 12 warehouses (200′ x 800′) were erected by a crew of from 50 to 75 men at an average time of 5 days per warehouse.*

ERECTION IS IMPORTANT

...BUILD WITH TIMBER STRUCTURES

The final test of Timber Structures service to contractors, engineers and architects is the efficiency with which buildings can be erected. All along the line, from first blueprints, through plant prefabrication, inspection, assembly and shipment to jobsite, every step must be coordinated so that erection requires a minimum of time, machinery and manpower. How well this is achieved is illustrated by these typical examples:

1. For an aircraft hangar, an 85′ boom mounted on Caterpillar traction was the only erection equipment needed for putting seven 162′ glued laminated roof trusses in place.
2. A shipyard mold loft 240′ x 130′ was erected in its entirety in four 8-hour shifts.
3. Working hundreds of miles from civilization, a 420′ permanent timber bridge was erected on the Alaska Highway with efficiency and dispatch.

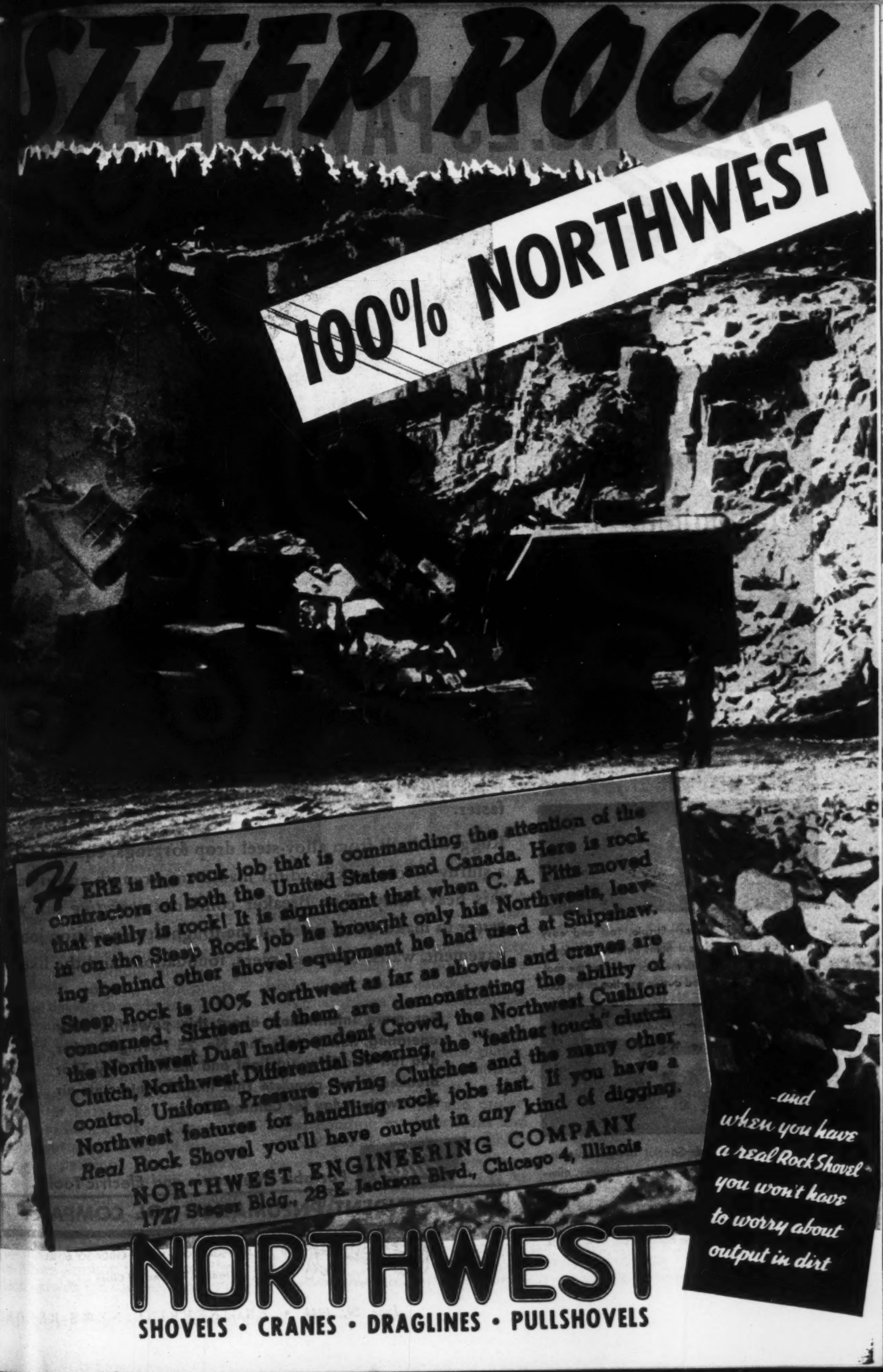
Key erection men are available from Timber Structures if desired. They are thoroughly familiar with erection procedure for all types of building

Erection is but one feature our "Engineering in Wood" polic Others are research, design, enginee ing, prefabrication, inspection, tran portation. All are responsible f the construction speed, econom strength and permanence of roof tru ses and other items furnished by us.

We invite inquiries as to work pe formed and as to our ability to ser you in timber and allied structur materials. Write for literature.

Engineering in Wood

TIMBER STRUCTURES
INCORPORATED
Portland 8, Ore. New York 17, N.



HERE is the rock job that is commanding the attention of the contractors of both the United States and Canada. Here is rock that really is rock! It is significant that when C. A. Pitts moved in on the Steep Rock job he brought only his Northwests, leaving behind other shovel equipment he had used at Shipshaw.

Steep Rock is 100% Northwest as far as shovels and cranes are concerned. Sixteen of them are demonstrating the ability of the Northwest Dual Independent Crowd, the Northwest Cushion Clutch, Northwest Differential Steering, the "feather touch" clutch control, Uniform Pressure Swing Clutches and the many other Northwest features for handling rock jobs fast. If you have a *Real* Rock Shovel you'll have output in any kind of digging.

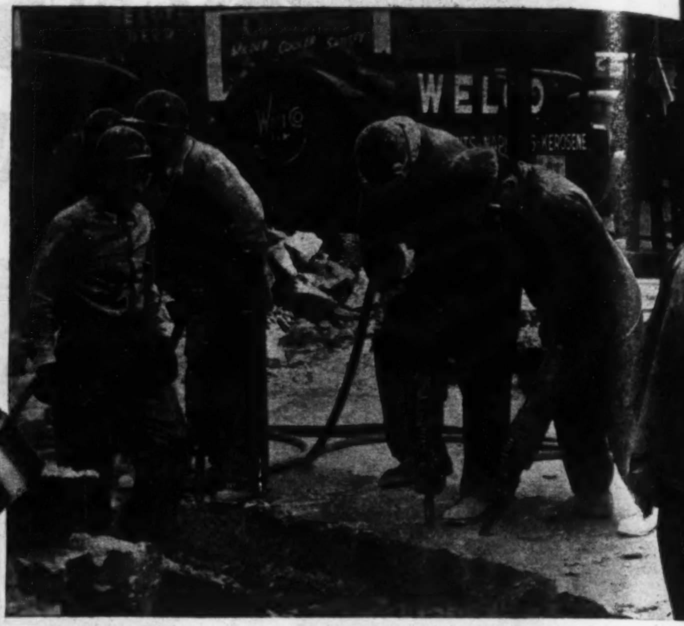
NORTHWEST ENGINEERING COMPANY
1727 Steger Bldg., 28 E. Jackson Blvd., Chicago 4, Illinois

-and when you have a real Rock Shovel you won't have to worry about output in dirt

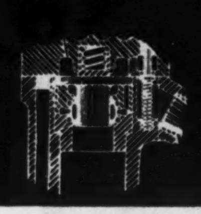
NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

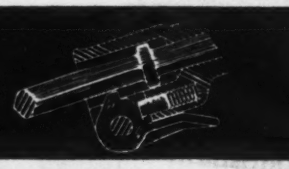
Thor No. 25 PAVING BREAKE



These THOR Features *Speed* Heavy Demolition Jobs!



- **Positive Short-Travel Tubular Valve**—Gets every ounce of power from every foot of air entering the machine. Actuates a block type piston that minimizes vibration to provide handling ease. Provides low air consumption.



- **Latch Type Retainer**—Simple, fast and easy to operate. Spring detent holds retainer in closed position . . . Pressing with the foot releases the tool. No adjustment is required during insertion of the tool.

- **4-Bolt Back Head**—Special design maintains rigidity between the back head and cylinder, eliminating air leakage and excessive bolt breakage when machine is used for prying. Made of drop forged, heat treated alloy steel. Equipped with rubber grips that keep the handle cool at all times.

BUILT for Heavy Duty . . .
DESIGNED for Fast, Easy Handlin

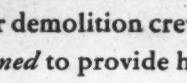
The Thor No. 25 Paving Breaker is the heavy duty "boss" o the Thor demolition crew . . . *built* for the hardest kind of job yet *designed* to provide handling ease that gets those jobs don faster.

Ruggedly built from alloy-steel drop forgings, equipped wit a sturdy 4-bolt back head for maximum strength and rigidity this heavy duty Thor Breaker combines *operating ease* wit *power* to make quick work of the toughest demolition jobs i pavement, walls, columns, piers, foundations and the like.

For more information about this powerful, easy operating, heavy duty Thor No. 25 Paving Breaker and full details about light and medium duty Thor Breakers in the *complete* Thor line of contractors air tools write today for Catalog 42-A.

Thor *Portable Pneumatic and Electric Tools*

INDEPENDENT PNEUMATIC TOOL COMPANY



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ROSION COSTS YOU MORE THAN WROUGHT IRON

e inside story of how BYERS WROUGHT IRON combats corrosion and resists fatigue

ou took a tiny section of Byers
ought Iron no larger than a
in of dust, and enlarged it so
dimensions were magnified 100
es . . . this is how it would look.
e close-up gives the inside story
how and why wrought iron re-
s corrosion, and withstands re-
ated stresses without fatigue.

The main body is high-purity
n. The darker threads are "iron-
ss"—silica slag, representing 2
3% of the material by weight,
ich is distributed in the form of
ers through the matrix.

When corrosion strikes the slag
ers it is halted, for they are
mune to attack. It is dispersed
er the surface, instead of localiz-
g and causing early failure
ough pitting. As the action con-
ues, a constantly increasing
ea of slag surface is exposed,
ich leaves a constantly decreas-
g area for corrosion to work on.
e fibers anchor the initial film,
ich shields the underlying metal
as a scab protects a wound.

The fibers also give the material a distinctive physical structure which might be compared to that of a stranded wire cable. This accounts for wrought iron's ability to resist premature fatigue failure from vibration and shock.

Wrought Iron's service qualities are unusually important in heavy construction work, and have led to its use in pier protection plates, railings, decks, and blast plates on bridges; in penstocks and outfall lines; in underground and underwater conduit; in waterworks and sewage plants; in tanks, fuel-handling equipment, breeching and stacks; in all sorts of plumbing, process and heating lines—including, of course, radiant heating; and in a hundred other applications where corrosion or vibration shorten the life of ordinary materials.

In specifying, it is well to remember that the proven service qualities of wrought iron are the direct result of its unique composition and structure . . . and that the only way of obtaining these qualities is to specify "wrought iron."

A. M. Byers Company, Established 1864, offices in Pittsburgh, Boston, New York, Philadelphia, Washington, Chicago, St. Louis, Houston, Seattle, San Francisco.

BYERS
GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE ALLOY STEELS · OPEN HEARTH ALLOY STEELS
CARBON STEEL TUBULAR PRODUCTS

Here's a jo
I'm proud

OFFICIAL U. S. NAVY PHOTOGRAPH

Flaps down! Hook down! TIGER BRAND landing ropes up!

"It's no easy job landing on a carrier. It may be an 'airfield that floats' but it isn't the best landing strip in the world. You have only a very short distance in which to land, and stop. Long swells make the deck roll. You make a wide turn around the stern and head in. The landing officer draws a hand across his throat. Cut! You close the throttle and slap her down. The hook catches a landing rope, your wheels strike, and you are pulled to a stop. You're down!"

• • •

INDISPENSABLE part of the ingenious arresting gear that gentles a landing plane to a safe stop on a U.S. carrier's flight deck, American Tiger Brand Wire Rope does its part in carrying our Navy's aerial punch to every far-flung corner of the seven seas.

Made of high-strength steel, the special Tiger Brand Arresting Gear Rope (Excellay Preformed) was selected for the major share of these installations because it ideally combines the strength, stamina and flexibility vital for safety in this highly hazardous duty.

This application of Tiger Brand is typical of many wartime uses in which our research and manufacturing departments have collaborated to produce wire rope to meet severe and unusual requirements. It is on the basis of such accomplishment that we can promise you in Tiger Brand a better product than ever before, when wire rope again becomes fully available for civilian service.

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
San Francisco
United States Steel Export Company, New York

Excellay Preformed

UNITED STATES STEEL

W

The Case of "SLATE DISPOSAL HEADACHES"

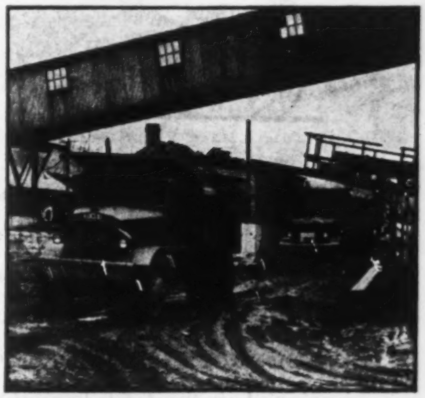
How a large bituminous coal producer
solved a most troublesome problem

THE COMPANY AND PROPERTY: The Weirton Coal Company, Isabella Mine, located in Southwestern Pennsylvania.

THE PROBLEM: Aerial tram equipment lacked adequate capacity to remove all of the slate and mine refuse of present peak operations — continued steady use of tram would necessitate costly moving of towers in two or three years. Use of small trucks to supplement tram for slate disposal was tried but proved to be unsatisfactory because of high operating and maintenance costs.

SOLUTION: Five small trucks were replaced by two Model 2FD Rear-Dump EUCLIDS of 15-ton capacity. One of the Euclids is used as a standby unit because of the six day 'round the clock operation. Both the aerial tram and second Euclid are put into service only at peak periods, a single Euclid being adequate to handle average output of slate.

RESULT: The company has reduced their cost of hauling and dumping slate and refuse, and has greatly prolonged the usefulness of the aerial tram in its present location. The standby Euclid is used one or two shifts each week to haul coal for the company's beehive coke ovens. When the two Euclids were purchased to replace the small trucks, it was thought that steady operation of the aerial tram would have to be continued, but the speed and capacity of the Rear-Dump EUCLIDS has made tram use unnecessary except at peak periods.



- If you have a problem of moving large amounts of earth, ore, rock, or coal on off-the-highway hauls, call on your Euclid distributor or write us direct if you prefer. A recommendation based on practical applications of Euclid equipment on similar jobs involves no obligation.

The EUCLID ROAD MACHINERY Co. · · · Cleveland 17, Ohio

EUCLID

SELF-POWERED
HAULING EQUIPMENT
For EARTH ROCK COAL ORE

EUCLID

Albanene
the stabilized
TRACING
PAPER

★**STABILIZED** to keep its toughness and transparency — that's Albanene Tracing Paper. Because it is treated with crystal-clear Albanite, a new synthetic solid developed in the K&E laboratories—Albanene will not oxidize, become brittle or lose transparency with age. Albanene's improved drawing surface takes ink or pencil fluently, erases with ease . . . Ask your K&E dealer.

TRADE MARK K+E

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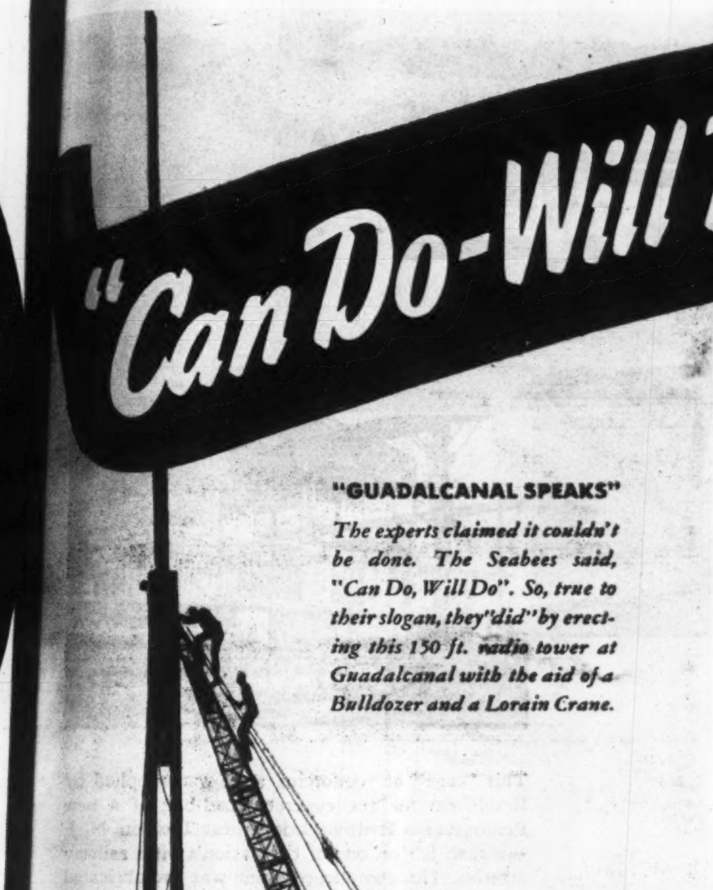

"Can Do-Will Do-DID"

"GUADALCANAL SPEAKS"

The experts claimed it couldn't be done. The Seabees said, "Can Do, Will Do". So, true to their slogan, they "did" by erecting this 150 ft. radio tower at Guadalcanal with the aid of a Bulldozer and a Lorain Crane.

DAILY, the list grows longer, the record more amazing, of the jobs being performed by the famed Seabees in the drive to Tokyo and Berlin.

And, closely related to the records being run up by these famed construction battalions, are almost unbelievable exploits of the tractors, bulldozers, shovels, and cranes that travel with them. We know, too, that among them are many noteworthy achievements of Lorains performing material handling jobs no one ever dreamed they would ever be asked to do, proving again their versatility, ruggedness, extra power and speed under the toughest imaginable conditions.

But, there are still bigger jobs coming up in the postwar period . . . when efficient and dependable equipment will be equally vital. And, because of Lorains' war-proven developments and performance you can figure on being in a better competitive position to *get* and *work* those big peacetime jobs—at a profit—with Lorains.

THE THEW SHOVEL COMPANY
LORAIN, OHIO

Official U. S. Navy Photograph

Reg. Trade Mark

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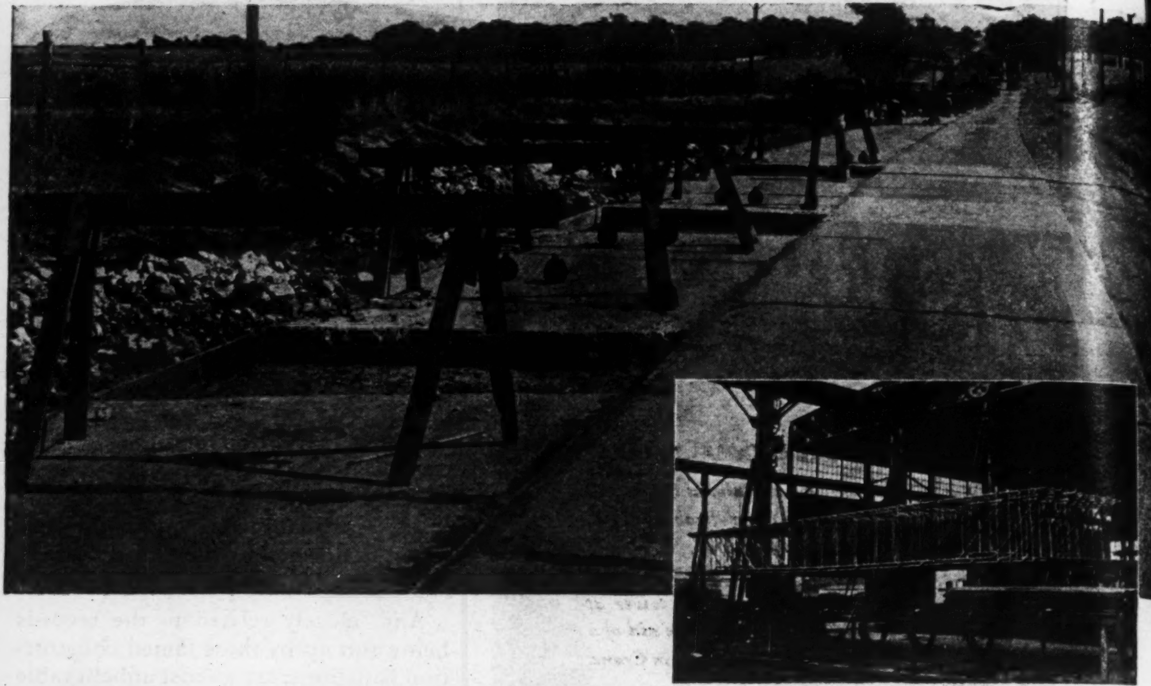


Why concrete roads need steel reinforcement

This "cage" of reinforcing steel was supplied by Bethlehem for the concrete road-bed of a new Pennsylvania Railroad bridge near Trenton, N. J.—a rush job on one of the nation's vital railway arteries. The complicated unit was prefabricated in Bethlehem's Philadelphia warehouse, and shipped to the job site as shown.

Next time *you* need reinforcing bars, even though you may not wish to have them preassembled and shipped as a unit, remember there's a Bethlehem warehouse near you, equipped to cut and bend bars in any shape or size you require.

No steel reinforcement in this concrete road—and so it's cracking up. A tragic and familiar story, today, when wartime traffic jounces and bounces over obsolescent highways, chewing up precious rubber, suffering delays, and putting a cruel strain upon essential vehicles.

Fortunately, however, the great majority of our roads have stood up sturdily under their heavy burdens—thanks to wise pre-war building practices.

In the construction of such highways, without which our war production effort might have been a very different story, Bethlehem Road Products have played a substantial role. Bethlehem Reinforcing Bars, Bar Mats and Road Joints, embedded in the concrete, have helped prevent cracks and heaving.

In addition, Bethlehem Safety Beam Guard Rails and Steel Highway Posts have stood guard alongside the key highways on which war workers, war supplies and military convoys roll safely to their destinations.

Bethlehem Road Products

ROAD JOINTS
REINFORCING BARS AND BAR MATS
DOWELS
DOWEL BAR SUPPORTS
BAR TIES
HIGHWAY GUARD CABLE
CABLE BRACKETS
SAFETY BEAM GUARD RAILS
GUARD RAIL ANCHOR RODS
STEEL HIGHWAY POSTS
STEEL SHEET PILING
STEEL H AND Z PILING
TURNBUCKLES
WIRE ROPE AND STRAND

★ ★ ★ BETHLEHEM STEEL ★ ★ ★

LAME THAT ARBON ON A AZY" OIL!

. . . keep Diesels on the "GO" with hard-working TALPEX

UNDER TODAY'S OPERATING CONDITIONS a "lazy" oil piles up carbon faster than ever . . . causes excessive sludge in the crankcase, lacquer deposits on rings and pistons. A "lazy" oil simply doesn't have the properties to do a complete job of engine lubrication.

But many operators who have switched to new hard-working Talpex Oil find their engines running for longer periods of time between overhauls, and with greater operating efficiency. The reason is simple. A "lazy" oil is one that has only one, or perhaps two of the properties necessary to efficient engine operation. Shell Talpex has *all* of the necessary properties.

NEW SHELL TALPEX

Is Non-Corrosive to alloy bearings. Protects *all* lubricated engine parts against corrosion.

Has Exceptional Oxidation Stability. Holds to a minimum the formation of sludge, lacquer and other deterioration particles.

Has High Detergency. Helps keep carbon, lacquer and foreign particles from adhering to pistons and rings, valves, ports.

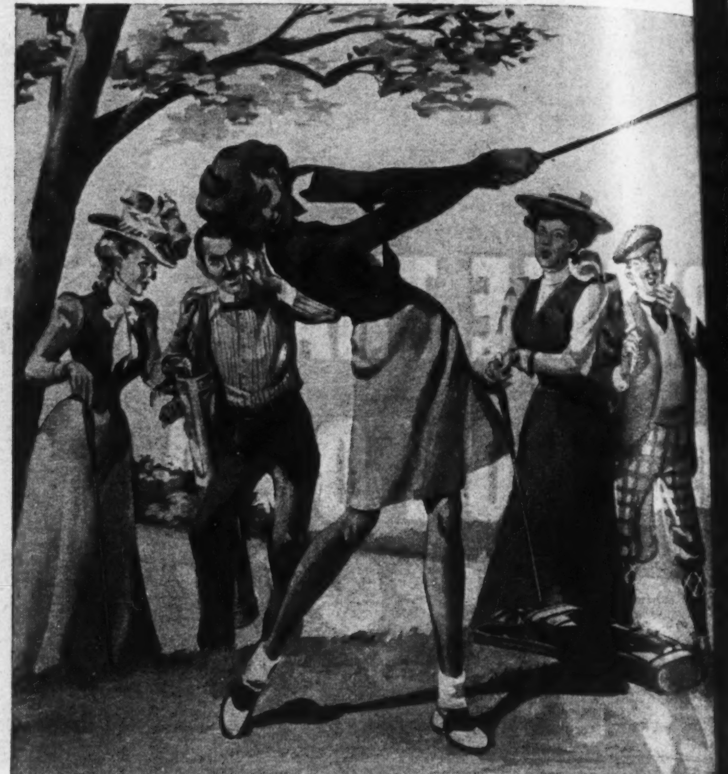
Has Low Carbon-Forming Tendency. Reduces ring sticking and wear. Lengthens engine life.

* * *

If the oil you now use does not have *all* these properties it's a "lazy" oil . . . should be changed to hard-working Shell Talpex. Ask the Shell man to show you why.

SHELL
TALPEX
HE NEW, ALL-PURPOSE
EAVY-DUTY LUBRICANT
trucks, busses, tractors, shovels
stationary and marine Diesels

There's been a big change



Plus-fours once brought in the low scores. And long skirts were the only acceptable dress. But all things change.

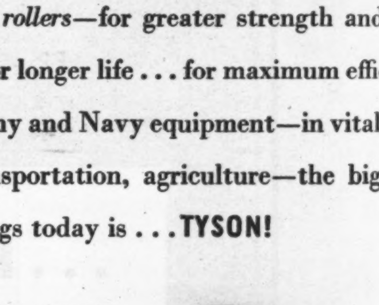
Even roller bearings have advanced. Tyson's new "All-Rolls" design is recognized as a vast improvement by users of heavy-duty equipment.

Size for size, Tyson has *thirty percent more load-carrying rollers*—for greater strength and rigidity . . . for longer life . . . for maximum efficiency.

In Army and Navy equipment—in vital industry, transportation, agriculture—the big name in bearings today is . . . **TYSON!**

TYSON BEARING CORPORATION, MASSILLON, OHIO

COUNT THE ROLLS - THE ROLLS COUNT



Tyson

TODAY'S HEAVY-DUTY BEARING

★ KEEP ON BUYING WAR BONDS ★

IGH·SPEED *TOURNAPULLS* SAVE
DUSTRIAL PLANT FROM RISING FLOOD WATERS

Fast-moving Tournapulls throw-up emergency levee to keep Illinois River water from stopping war production at R. G. LeTourneau, Inc., Peoria Plant. River raised 12 feet above average stage. Notice depth of water. Railroad tracks remain dry — shipments can continue.

ild 3,000 Feet of Levee, an erage of 5 Feet High and Feet Wide in 489 Machine Hours

he ability of rubber-tired rnapulls to haul dirt fast over ed city streets and wet, rutted l roads enabled R. G. LeTour- n, Inc. to fight the Illinois River standstill during a recent flood eat. These powerful dirtmovers led 9846 cu. yds. of clay and n over an 8,000-foot one-way l in 489 machine hours . . . t the emergency levee at an rage of 2 feet above the rapidly sing waters.

Without Tournapulls, this emer- cy dirtmoving job would have en impossible. The haul route included: city streets, four railroad crossings, a state highway, grades from 3 to 10%—and a considerable section of the soft top of the emergency levee.

Rubber-Tired Power the Answer

The large pneumatic tires on the Tournapulls not only allowed travel over paved surfaces but also gave ample flotation on the almost impassable levee roads—same time aided compaction on the levee. Plenty of excess power and rimpull for Tournapull weight permitted top speeds up to 14.9 m.p.h. on parts of the haul . . . also enabled the rigs to handle the adverse grades and to pull through the muddy spots.

COMPARE WITH OTHER METHODS

oblem: To move 9,846 cu. yds. over 8,000-foot one-way haul for emergency levee.

EQUIPMENT	Tournapulls Model Super C with 11-Yard Carryall	Tractors 90 H.P. Model with 11-Yard Scraper	Shovel 1¾-Yard Model 18—4-Yard Trucks
ACHINE HOURS REQUIRED	Actual Performance 489	Estimated Performance 1315	Estimated Performance 608

NOTE: Performance based on 40 minute hour or 66⅔% efficiency because of delays on haul route waiting for traffic at state highway, trains at railroad crossings and normal traffic flow of trucks and trains from shipping department.

High-speed, rubber-tired Tournapulls built this 3,000-foot levee 45.5 hours with an average use of 11 rigs. With tractor-drawn equip- ent it would have taken 29 units to do the same job in an equal amount time. The truck and shovel time could not be improved by adding its as 18 is the maximum for cycle loading on 8,000-foot one-way haul.

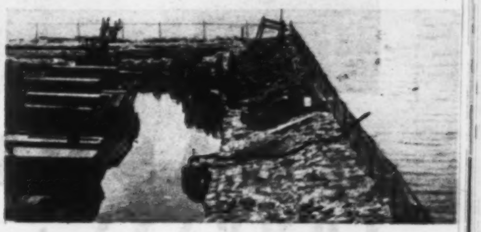
Ask About TOURNAPULLS for Your Jobs

For lowest-cost postwar earthmoving, plan to use the rubber-tired ower of Tournapulls. More than 1,800 are now in use. For detailed nformation on Tournapulls, write TODAY for the new 8-page inform- tive booklet — "The Trend to Rubber-Tired Power". Address: . G. LeTourneau, Inc., Dept. ENR 644, Peoria, Illinois.

▼ Large Tournapull and Carryall tires made hauling over paved streets possible. On 16,000-foot round trip, Tournapulls turned 10 corners, crossed 4 railroad tracks and a state highway.

▼ Tournapulls were required to end-dump on one part of the levee. These earthmovers had plenty of power and maneuverability to back over the 9 loose yards. This eliminated much Dozer work; dirt could be placed near end of narrow levee.

▼ 275 feet of sandbag levee connects two sections of the dirt levee. Over 8,000 man hours were used to build this sandbag section — only 700 man hours for the 3,000-foot dirt levee.

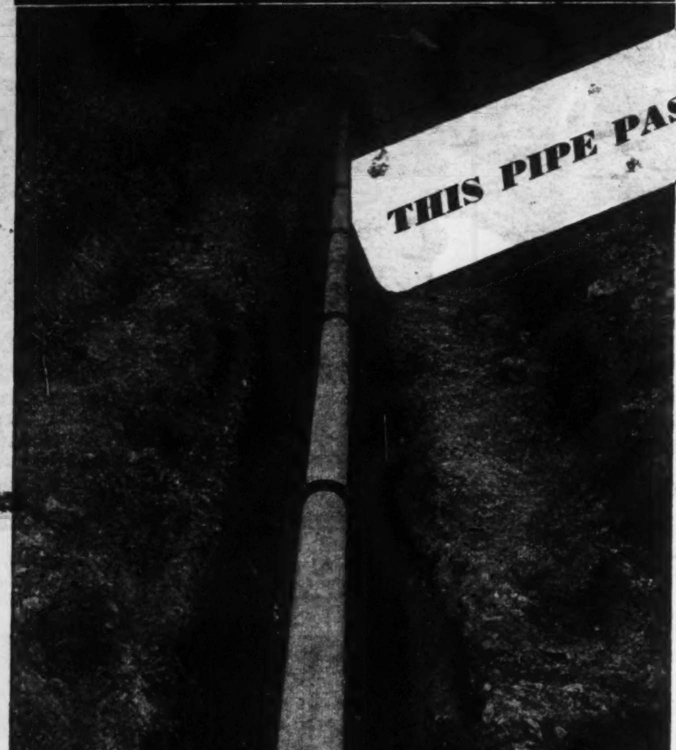


LETOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

OURNAPULLS • **RUBBER-TIRED POWER FOR FASTER EARTHMOVING**

Nature made Asbestos – HERE IS HOW KEASBEY & MATTISON IS MAKING IT SERVE THE WATER WORKS FIELD



THIS PIPE PASSED ITS "PHYSICAL"

K&M "Century" Asbest
Cement Pipe is immune to costly, troub
some tuberculation from *within*...
flow-hamper, no pressure cuts, no qui
replacements needed. It also resists co
rosive action from *without*... it is no
metallic and therefore unaffected
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nently smooth, free-flowing mains
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because you have a *healthy* line
pipe when you use K&M "Century
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"Century" is very moderate in pric
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it is low, because "Century" is lig
and easy to handle. Then there's re
saving in "Century's" long life witho
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K&M "Century" Asbestos-Cement Pi
is available NOW. Inquire today.

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Our Ambler plants proudly fly the Army-Navy "E" flag with its star—an honor awarded K&M employees "for continued outstanding production of war materials."

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New!
Ozalid
Rapid Black
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Now!
Ozalid
Transblack

the first *black-line, dry-developing intermediate* paper

Until now, you've been using a sepia-line paper to produce "intermediate originals" of your engineering drawings.

For until now, no manufacturer in the field has been able to create a satisfactory *black line* intermediate.

Now, Ozalid proudly offers—OZALID TRANSBLACK . . . with all of these desirable characteristics:

1. **Covering Power.** The lines of an Ozalid Transblack intermediate possess high actinic density, and produce *sharp prints without loss of detail.*
2. **Maximum Visual Density.** An Ozalid Transblack intermediate is easier to read and work on. Furthermore, since additions in pencil or pen *match the printed lines,* subsequent prints are more uniform than those produced from a sepia intermediate with black additions.
3. **Speed.** Ozalid Transblack intermediates can be made at fast speeds from average originals . . . and will produce subsequent prints at speeds *fast* for intermediates.
4. **Permanence.** Ozalid Transblack intermediates are *non-yellowing* and resistant to light and chemical action. Even after being filed away for years, they will produce excellent prints.
5. **No Increase in Price.** Ozalid Transblack sells at the same price as sepia papers. Before ordering, however, send for a FREE sample package. A test in your machine will convince you of Transblack's superiority.

*OZALID *RAPID BLACK* IS RECOMMENDED for producing the best "work" prints from originals or intermediate originals.

OZALID PRODUCTS DIVISION
GENERAL ANILINE & FILM CORPORATION
Johnson City, N. Y.

Gentlemen:

☐ Send a FREE sample package of OZALID TRANSBLACK for test purposes.

☐ Send printed samples of OZALID TRANSBLACK and OZALID RAPID BLACK.
ALSO catalog explaining Ozalid Process.

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Company____________________Title__________

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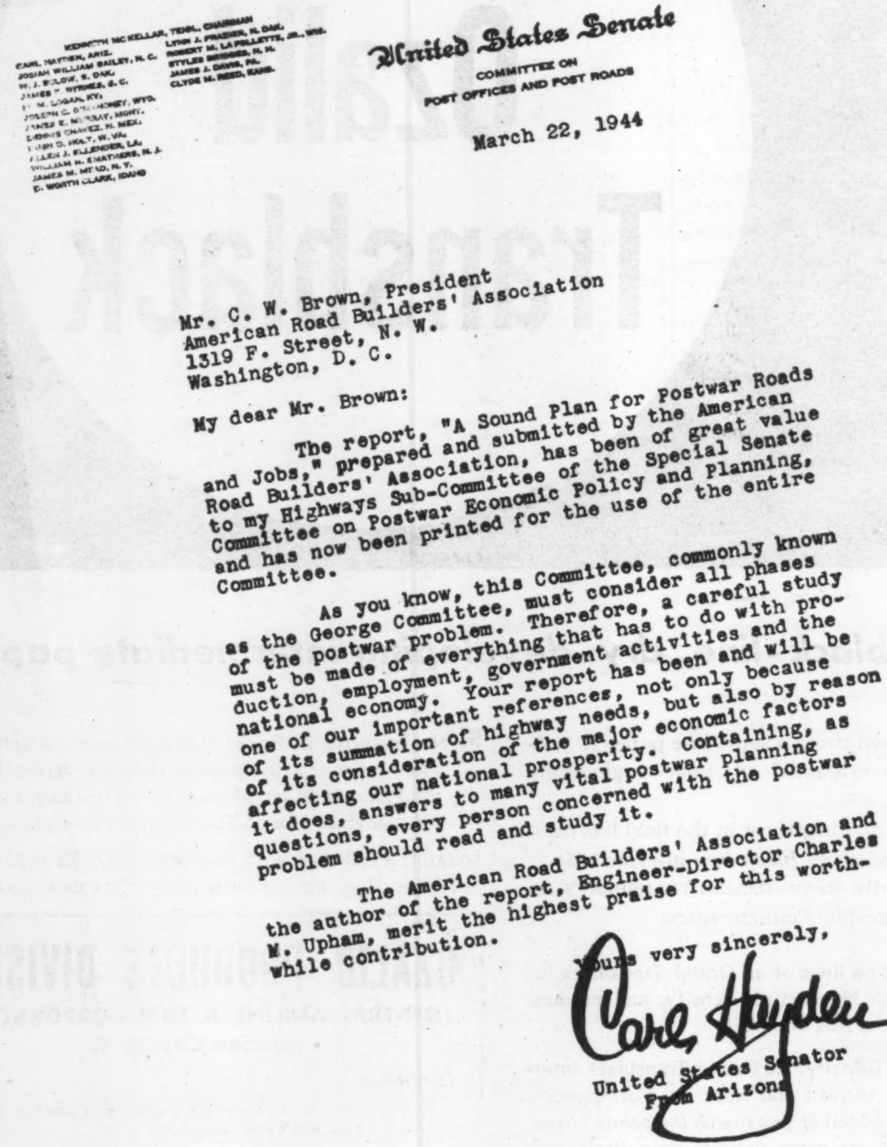
OZALID IN CANADA—HUGHES OWENS CO., LTD., MONTREAL

"EVERY PERSON SHOULD



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United States Senate
COMMITTEE ON
POST OFFICES AND POST ROADS

March 22, 1944

Mr. C. W. Brown, President
American Road Builders' Association
1319 F. Street, N. W.
Washington, D. C.

My dear Mr. Brown:

The report, "A Sound Plan for Postwar Roads and Jobs," prepared and submitted by the American Road Builders' Association, has been of great value to my Highways Sub-Committee of the Special Senate Committee on Postwar Economic Policy and Planning, and has now been printed for the use of the entire Committee.

As you know, this Committee, commonly known as the George Committee, must consider all phases of the postwar problem. Therefore, a careful study must be made of everything that has to do with production, employment, government activities and the national economy. Your report has been and will be one of our important references, not only because of its summation of highway needs, but also by reason of its consideration of the major economic factors affecting our national prosperity. Containing, as it does, answers to many vital postwar planning questions, every person concerned with the postwar problem should read and study it.

The American Road Builders' Association and the author of the report, Engineer-Director Charles M. Upham, merit the highest praise for this worthwhile contribution.

Yours very sincerely,

Carl Hayden

United States Senator
From Arizona

THIS ADVERTISEMENT CONTRIBUTED TO STIMULATE POSTWAR PREPAREDNESS

READ AND STUDY IT!"

Says U. S. Senator Carl Hayden, Chairman, Highway's Sub-Committee

When a Senator writes to urge everyone to get interested—that's news.

Senator Carl Hayden's letter reproduced on the facing page shows two healthy signs. It indicates that legislators appreciate the thoughts of the public on important matters. It also indicates that Senator Hayden and his Highway's Sub-Committee are on the job and looking ahead. This is indeed fortunate.

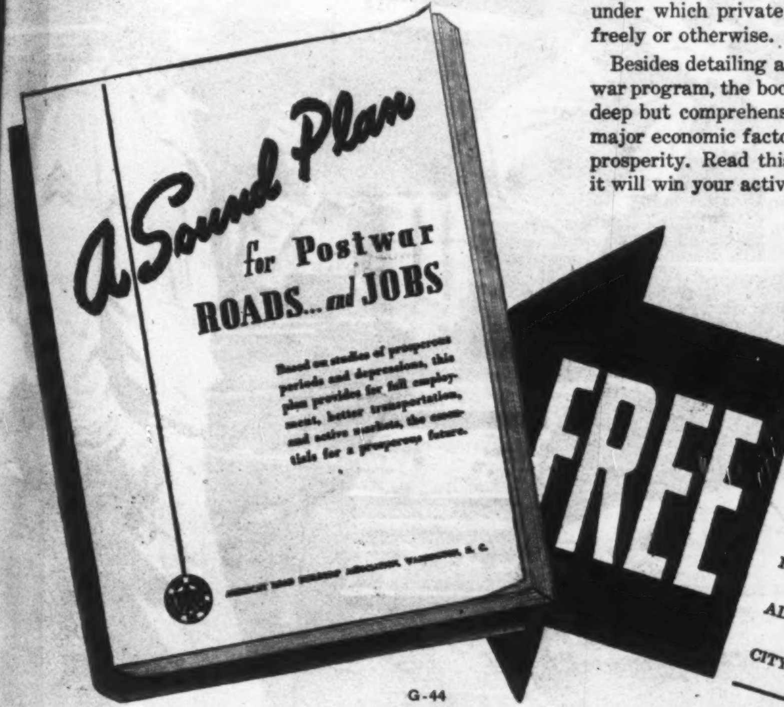
Every man, woman and child has an interest in the postwar highway building program. Good roads are a necessity, bringing countless benefits and savings to all. As a matter of fact, the economic structure of our country is built around the motor vehicle.

Many postwar plans will come before Congress. But that of the American Road Builders' Association is the first sound plan up for consideration which so greatly affects the prosperity of all without imposing a drain on the national economy.

The proposed highway program calls for an inter-regional system worked out by the American Association of State Highway Officials. Covering 34,000 miles, it will afford jobs for three million persons quickly. According to the U. S. Public Roads Administration, the three billion dollar annual budget proposed for it will eventually result in nine and one-half billion dollars in business transactions. Taxes and fees now levied for highways and streets, if used for the purpose, would eventually build and maintain the system.

What happens to the postwar highway building program will set a pattern, good or bad, under which private enterprise will function freely or otherwise.

Besides detailing a planned, plausible, postwar program, the book, "A Sound Plan", gives deep but comprehensive consideration to the major economic factors affecting our postwar prosperity. Read this book and we feel sure it will win your active support.


a Sound Plan
for Postwar
ROADS... and JOBS
Based on studies of prosperous periods and depressions, this plan provides for full employment, better transportation, and active markets, the essentials for a prosperous future.
American Road Builders' Association, Washington, D. C.
FREE

G-44

Charles M. Upham, Engineer-Director
American Road Builders' Association
1319 F St., N. W., Washington 4, D. C.
Please send "Sound Plan" book Free.

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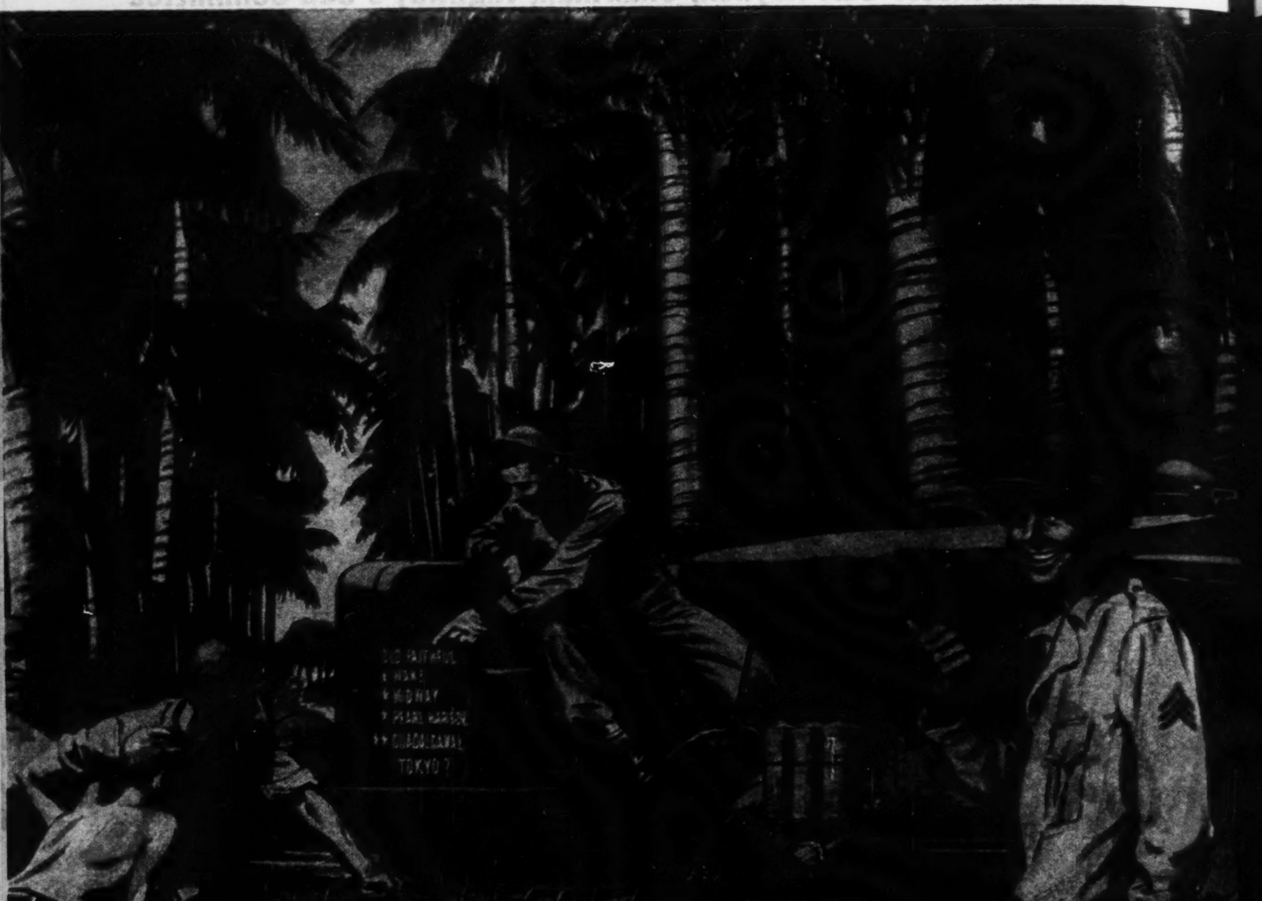
UNION WIRE ROPE CORPORATION

2134 MANCHESTER AVE., KANSAS CITY 3, MO.

PIN-UP GIRL

Painted from an actual photograph taken on Guadalcanal


OLD FAITHFUL
★ WAKE
★ MIDWAY
★ PEARL HARBOR
★★ GUADALCANAL
TOKYO ?

OF GUADALCANAL

THEY call her "Old Faithful"— as true a sweetheart as ever endeared herself to fighting men in all history. No slim and shapely beauty, she holds a treasured spot in the hearts of thousands of U. S. Marines and Navy Seabees.

She was on duty at Wake Island when the war began. She's seen wartime service on Midway and done her share in the repairs to Pearl Harbor. Then off to Guadalcanal she went, to toil and labor in the steaming heat of the jungles. And beneath the campaign stars which she so proudly wears is emblazoned the word "Tokyo," so there's no telling how far her adventures may carry her.

Silly, you say, to speak that way of a "Caterpillar" Diesel Tractor? Just ask any service man who has fought on the battlefields around the world! You'll discover a genuine, deep-rooted affection for these rugged machines . . . an affection inspired by the brawny power and tireless dependability fighting men admire.

They've gone side by side with our troops in the face of death . . . landed on beachheads and helped to hold them . . . hauled precious supplies to places of safety . . . hewed out airfields . . . helped build roads and bridges . . . demolished enemy pillboxes. With bulldozer blades raised, they've even spearheaded infantry attacks on machine-gun nests. And when landing barges laden with wounded have refused to budge, they've waded deep into the surf to nudge them off into the sea and on their way.

Already the history of this war is filled with countless tales of heroic men and the faithful "bulldozers" that have given them the priceless advantage of "workpower" over our enemies. Whenever you read one of these "'dozer" stories, you can be pretty sure it refers to a "Caterpillar" Diesel Tractor, whether it was equipped with a bulldozer blade or not.

And it's not only "Caterpillar" Diesel Tractors that are winning their laurels. Doing a thousand and more jobs on the various fighting fronts, "Caterpillar" Diesel Motor Graders, Engines and Electric Sets are earning their service stripes in every branch of the armed forces.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR DIESEL

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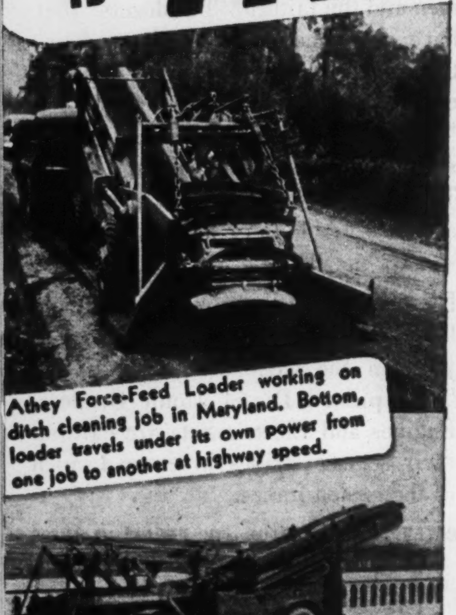
NOW – HIGHWAY MAINTENANCE LOADING

IS FAST AND SIMPLE..



Athey Force-Feed Loader working on ditch cleaning job in Maryland. Bottom, loader travels under its own power from one job to another at highway speed.

Loading surplus materials on highway maintenanc or construction isn't the time-wasting task it used to b Now, the self-propelled Athey Force-Feed Loader gathe up windrows of road material, on the move, and loads i into waiting trucks. The job is done quickly, economicall and at a saving in war-vital manpower.

This time and labor saving tool works as a companion to the Motor Grader on road widening, ditch cleaning, shoulder trimming, road grading and maintaining, resurfacing highways and other operations. Athey Force-Feed Loaders load every kind of surplus road materia faster and cheaper than ever before possible. A new folde describing this versatile loading unit will be mailed to you on request.

Write Athey Truss Wheel Co., 5631 W. 65th St., Chicago 38, Illinois,
or see your Athey-"Caterpillar" Dealer.

★ ★ ★

REEDOM OF OPPORTUNITY
MADE AMERICA GREAT
LETS HOLD ON TO IT!

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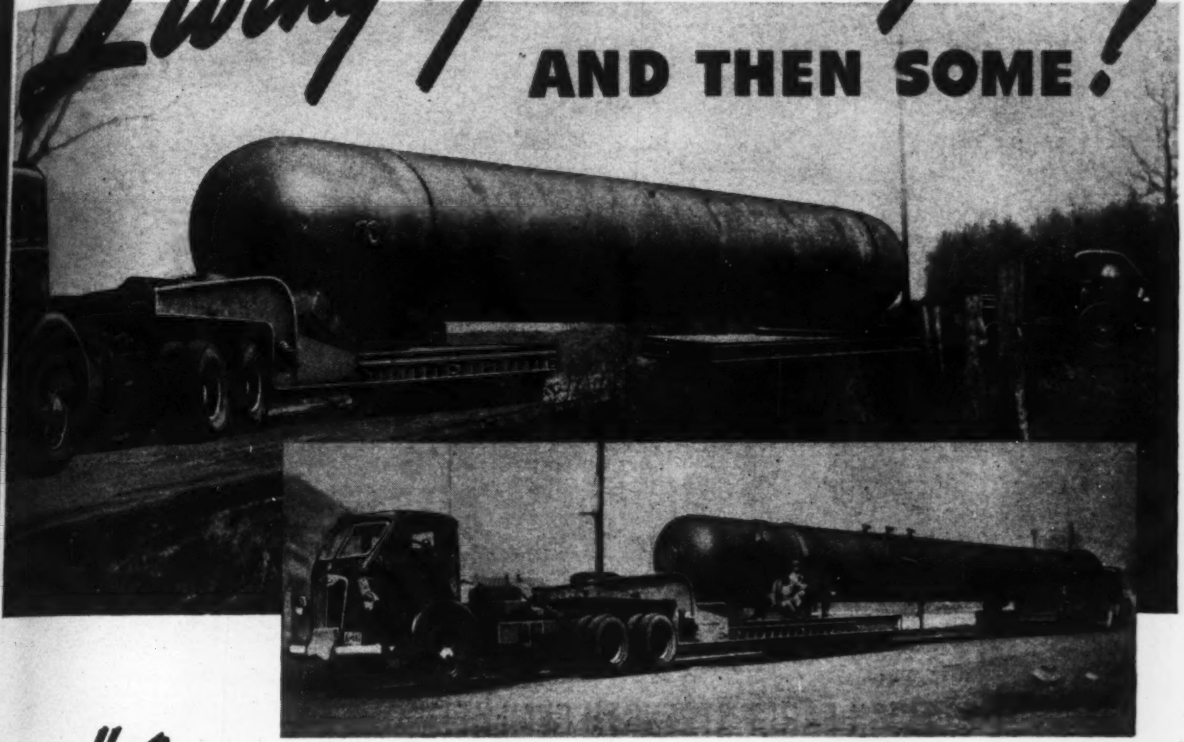
Athey

FORCE-FEED LOADER

Living up to a slogan—

AND THEN SOME!



"ANY LOAD THAT FITS THE ROAD!"

IS THE SLOGAN OF THE ARTHUR MORGAN TRUCKING COMPANY, ST. LOUIS, WHO SPECIALIZE IN MOVING HEAVY EQUIPMENT, AND DEPEND ON FRUEHAUF CARRYALLS FOR THIS WORK

But the Morgan people went beyond their slogan when they tackled the job of moving this huge gasoline cracking tank to the Illinois oil fields. For the big tank—weighing 100 tons—had to be hauled not only over the highway, but also through two miles of open fields to reach the job site.

The tank was loaded on two Fruehauf heavy-duty Carryalls, each coupled to a tractor. The combination unit had 52 wheels. Vehicles and load measured 128 feet long, 10 feet wide and 15 feet high.

Special permits were secured and the State Highway Patrol blocked out 10 miles of the Illinois State Highway while the load went through.

This is an unusual operation, of course, but it shows the adaptability of Fruehauf Carryalls to difficult, specialized hauling jobs that couldn't be handled by any other means.

Fruehauf Carryalls are built in a wide selection of sizes and designs. They range in capacity from 10 to 100 tons . . . are available in either semi or full-Trailer types . . . single or double-drop frame . . . side or rear loading . . . with 4 tires or up to 24 . . . in a variety of wheel and axle combinations . . . any width . . . any length . . . the applications to your special needs are endless.

There is no inclination to adjust your requirements to our product—because it is just as easy, and far more satisfactory, to fit our product exactly to your requirements.

Today is none too soon to have our engineers prepare the blueprints for your postwar Carryall. This costs you nothing extra—but it may save you weeks in the long run.

World's Largest Builders of Truck-Trailers

FRUEHAUF TRAILER COMPANY • DETROIT

Service in Principal Cities

Fruehauf Trailers

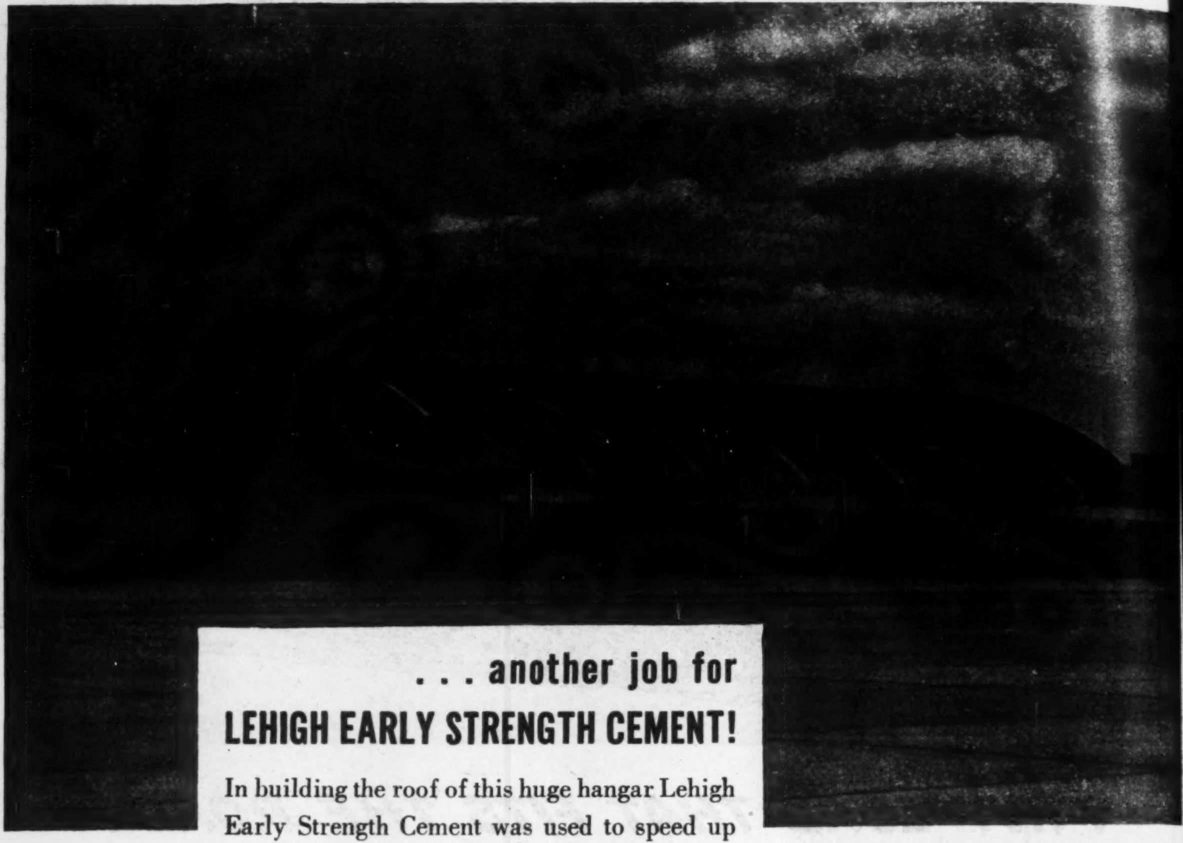
A TRUCK IS LIKE A HORSE

IT CAN PULL MORE THAN IT CAN CARRY

"Engineered Transportation"

REG. U. S. PAT. OFF.

Build it to LAST . . . but build it FAST



The First Fighter Command wanted this permanent Air Base Hangar along the Atlantic Seaboard built in a hurry. Lehigh Early Strength Cement helped the Contractor—McCloskey & Co. of Philadelphia—to speed up the work. Engineers and Architects were Roberts & Schaefer Company, Chicago, Ill.

. . . another job for LEHIGH EARLY STRENGTH CEMENT!

In building the roof of this huge hangar Lehigh Early Strength Cement was used to speed up construction. Each set of forms was removed in *three* days! With normal cement, *at least* seven days would have been required. Early removal and re-use of forms resulted in a sizable saving in forms cost. Furthermore, because the job was started in the winter-time, quick curing concrete also reduced danger of frost damage. And there was no waiting for scarce materials because "the makings" for concrete were always available.

On your very next contract, figure on Lehigh Early Strength Cement. If your figures are right, you'll find big savings—in construction time, in labor and in equipment costs. For expert advice, write to our Service Department.

Lehigh
CEMENT

LEHIGH EARLY STRENGTH CEMENT for service-strength concrete in a hurry

LEHIGH PORTLAND CEMENT COMPANY • ALLENTOWN, PA. • CHICAGO, ILL. • SPOKANE, WASH.

AIR PLUS JAEGER COMPRESSOR

We are producing for Uncle Sam today the compressor you'll demand tomorrow . . . built to the micro-precision of fine aircraft motors

Courtesy AVIATION

"AIR PLUS" Jaeger Vertical Two-Stage, Air-Cooled Compressors, in sizes from 60 to 500 ft., will be available to help you win your battles tomorrow.

THE JAEGER MACHINE CO., COLUMBUS 16, OHIO

JAEGER *Engineered* **EQUIPMENT**

"AIR-PLUS" 2-STAGE AIR-COOLED COMPRESSORS, 60 TO 500 FT.—"FLEET-FOOT" CRANE-LOADERS—"SURE PRIME" CENTRIFUGAL PUMPS—"SPEEDLINE" BUILDING MIXERS—"DUAL-MIX" TRUCK MIXERS—"JAEGER" HOISTING ENGINES AND TOWERS—"JAEGER-LAKEWOOD" PAVING EQUIPMENT

IMMEDIATE
STOCK SHIPMENTS
ON MOST TYPES

BEFORE YOU ORDER WELDING ELECTRODES . . .

consult Westinghouse

Westinghouse is pleased to announce greatly improved deliveries on electrodes . . . immediate stock shipment on most types.

Among those immediately available is the new ACP electrode which is definitely superior for all-position a-c or d-c reverse-polarity work. While this electrode has been in production and use for considerable time, its announcement to the trade has been withheld pending the building up of present substantial stocks. (See current trade papers for formal announcement.)

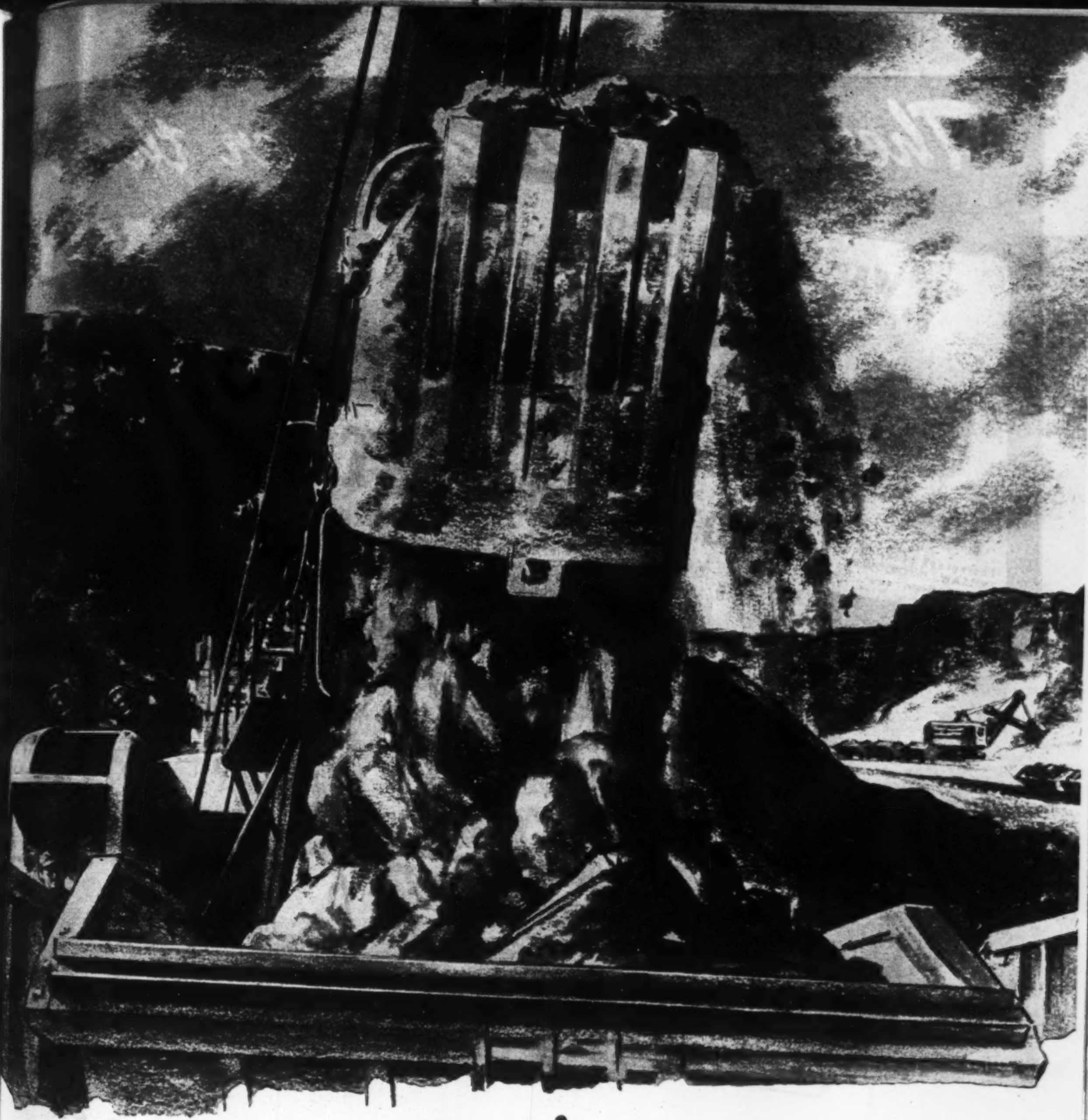
Also available for shipment now is the famous DH electrode for high-speed, horizontal fillet and flat welds where high quality is essential. Likewise ready for quick delivery are standard AP (d-c) and FP (a-c or d-c) electrodes.

Wire or phone your nearest Westinghouse office for complete details and definite shipping data. Westinghouse Electric & Manufacturing Company, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-90536

WESTINGHOUSE

WESTINGHOUSE PRESENTS—*JOHN CHARLES THOMAS—SUN. 2:30 E. W. T., N. B. C.—"TOP OF THE EVENING"—MON. WED. FRI. 10:15 E. W. T. BLUE NETWORK*

Westinghouse
PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE



Rubber Mine - 1944!

Yes, today, rubber is actually being mined. Not latex, to be sure, but the vital element from which a widely used synthetic rubber is made. The transition from rock to rubber begins with ordinary limestone, a plentiful source of carbide. And from carbide comes acetylene, basis of the new material.

American vision recognized the need for such a process. American genius developed the method itself. And American mass production brought the plan to fulfillment.

Today, limestone pours from the nation's quarries in a never-ending stream as P&H Electric Shovels dig night and day to keep pace with war's ravenous appetite for vital raw materials... limestone, copper, iron ore, coal.

In meeting today's challenge of war, the big P&H Electric Shovels have already begun to answer the challenge of tomorrow with swifter, steadier, lower cost production than has ever been known in large scale mining.

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Overhead Cranes • Electric Hoists
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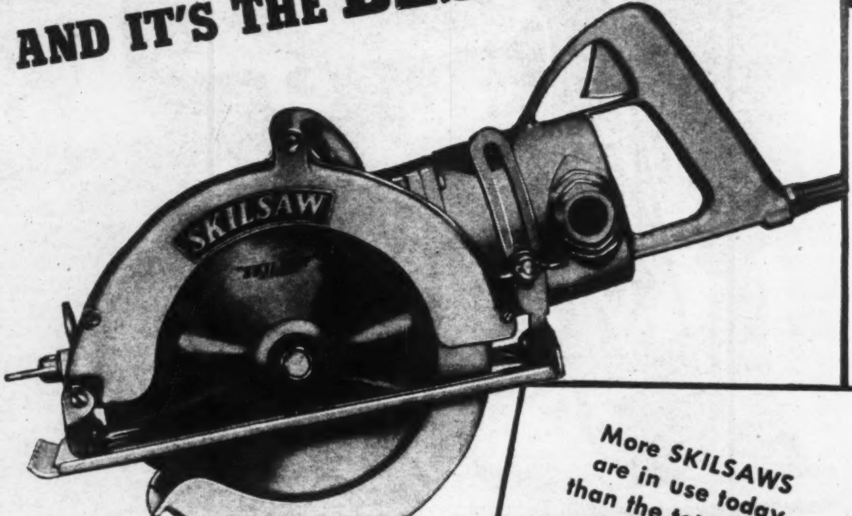
There's Nothing Finer than SKILSAW!

IT WAS FIRST IN 1923

Photograph of the first SKILSAW...the ORIGINAL portable electric saw.

AND IT'S THE BEST IN 1944!



More SKILSAWS are in use today than the total of all other makes of portable electric saws!

● It's no wonder that SKILSAW is *the most popular saw* among contractors everywhere. SKILSAW is better built, more efficient, more dependable. Every SKILSAW made is the product of constant effort to improve everything that goes into it—materials, craftsmanship and design.

Ever since 1923, SKILSAW has helped contractors do a *better* job of building. Before the War, SKILSAW speeded the construction of thousands of homes, industrial plants and factories. Since Pearl Harbor, SKILSAW has helped build vital war plants, barracks, airdromes, war housing projects, *even faster.*

SKILSAW is the most valuable time-saving and labor-saving tool you can have! It makes every cut in construction *quicker* . . . makes every worker count for more! Ask your distributor to demonstrate SKILSAW *today!*

★ ★ ★

Look to SKILSAW for continued leadership! When private building returns . . . new, lighter weight and more efficient SKILSAWS will be ready to speed up all of your sawing . . . to make more profit for you on every construction job.

SKILSAW, INC.
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SKILSAW PORTABLE ELECTRIC TOOLS
MAKE AMERICA'S HANDS MORE PRODUCTIVE

THESE SLINGS PASS
WARTIME
INSPECTION
FOR SAFETY...SPEED...ECONOMY
OF MANPOWER AND MATERIALS

When virtually every load is tagged for war production, efficient handling becomes an obligation—one you'll discharge on all counts with Yellow Strand Braided Wire Rope Slings.* *Safety?* The strength of this patented sling lies in tough Yellow Strand Wire Rope, so braided that it gains marked flexibility . . . conforms readily to any product . . . grips it gently but securely. *Speed?* Light weight and high kink-resistance make the sling easy to carry, attach and remove. *Economy?* A compact braided sling conserves manpower and materials, compared with bulky types. Even when lifting heavy locomotives, turbines, pressure towers or weapons, a Yellow Strand Braided Sling will require fewer men—and less steel. And for such lighter lifts as jigs, tools, drums or crates, a Yellow Strand Sling offers relief from the fiber shortage. Fitting material-handling equipment to your specific job is the function of Broderick & Bascom's specialized Sling Engineers. Investigate today!

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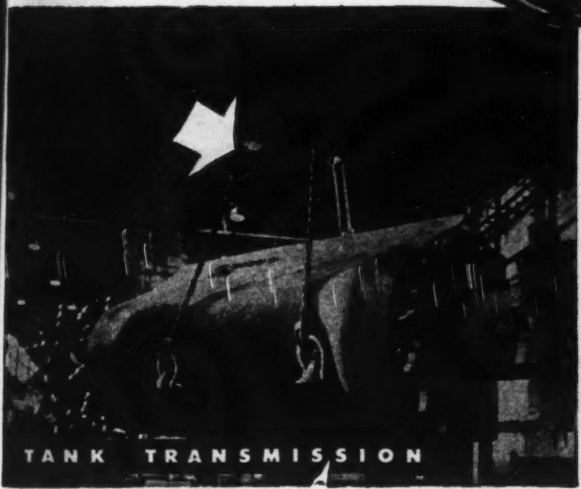
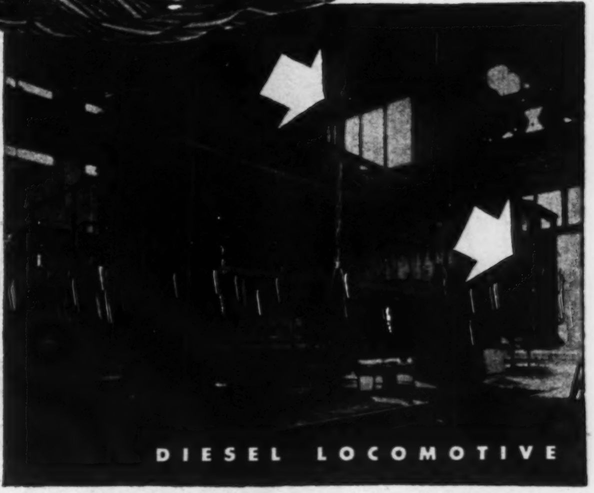
Riggers' Hand Book
96-pages of practical wire rope sling information. Send for free copy.



TANK TRANSMISSION



DIESEL LOCOMOTIVE

*Patents: U. S., 1475859, 1524871, 2142841, 2142842, 2299568 • Canadian, 252874, 258068

ARMY E NAVY

BRODERICK & BASCOM

YELLOW STRAND
Braided Wire Rope SAFETY SLINGS

YOUR LINK-BELT SPEEDER HAS GONE TO WAR—

ON FRONTS ALL OVER THE WORLD!

LINK-BELT SPEEDERS ON
HEAVY-DUTY WORK
IN MARINSHIP CORP. YARDS AT SAUSALITO, CALIFORNI
Buy More Bonds and Hold Them Until Maturity!

Link-Belt Speeder Zephyrcrane operating in plate shop area.

These steel gratings are used for tanker runways and catwalks.

Link-Belt Speeder loading material on tanker at outfitting docks.

9577

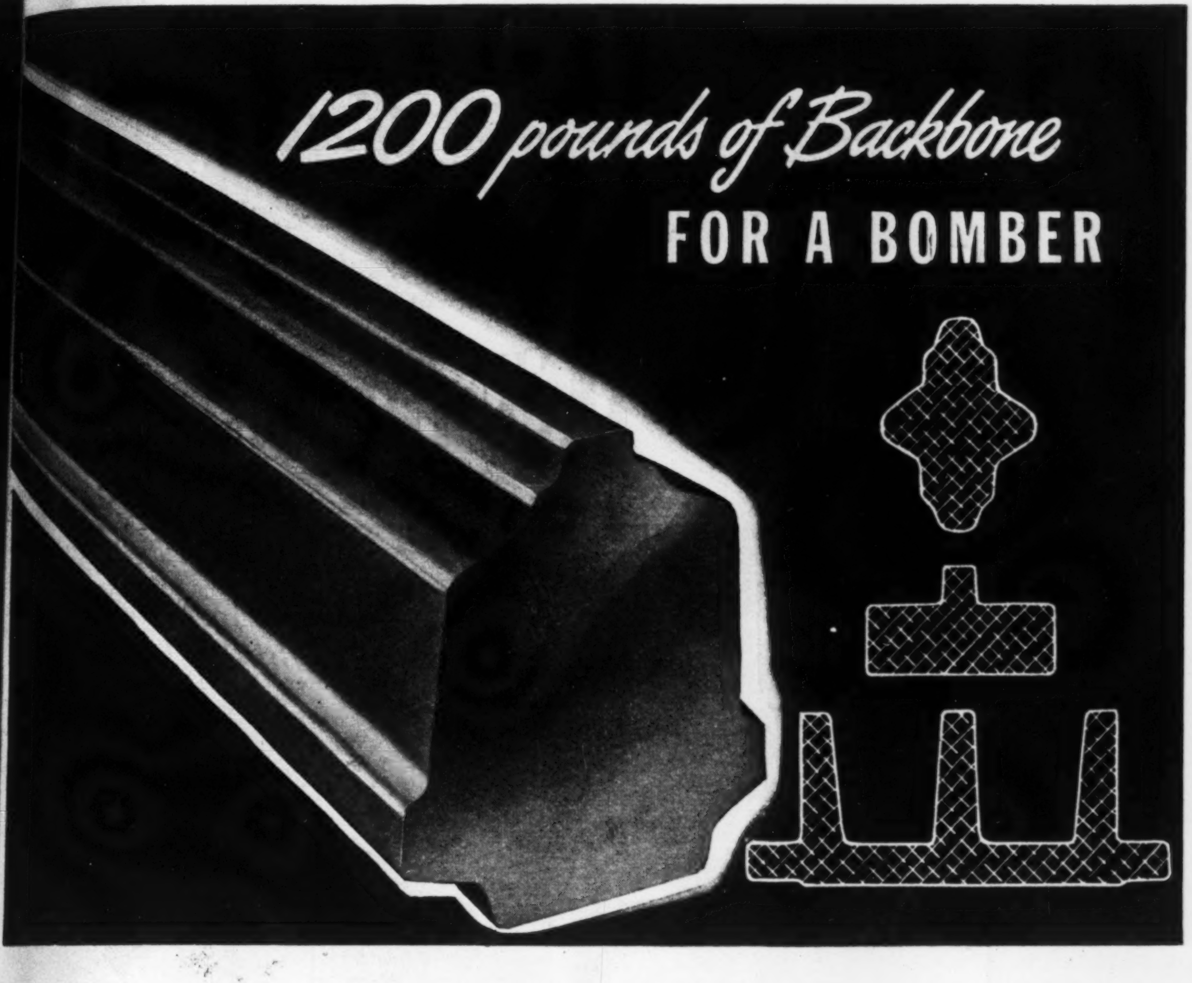
LINK-BELT SPEEDER

Builders of the Most Complete Line of

SHOVELS—CRANES—DRAGLINES

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO 9, ILL.

A DIVISION OF LINK-BELT COMPANY



What will this wartime development do for you?

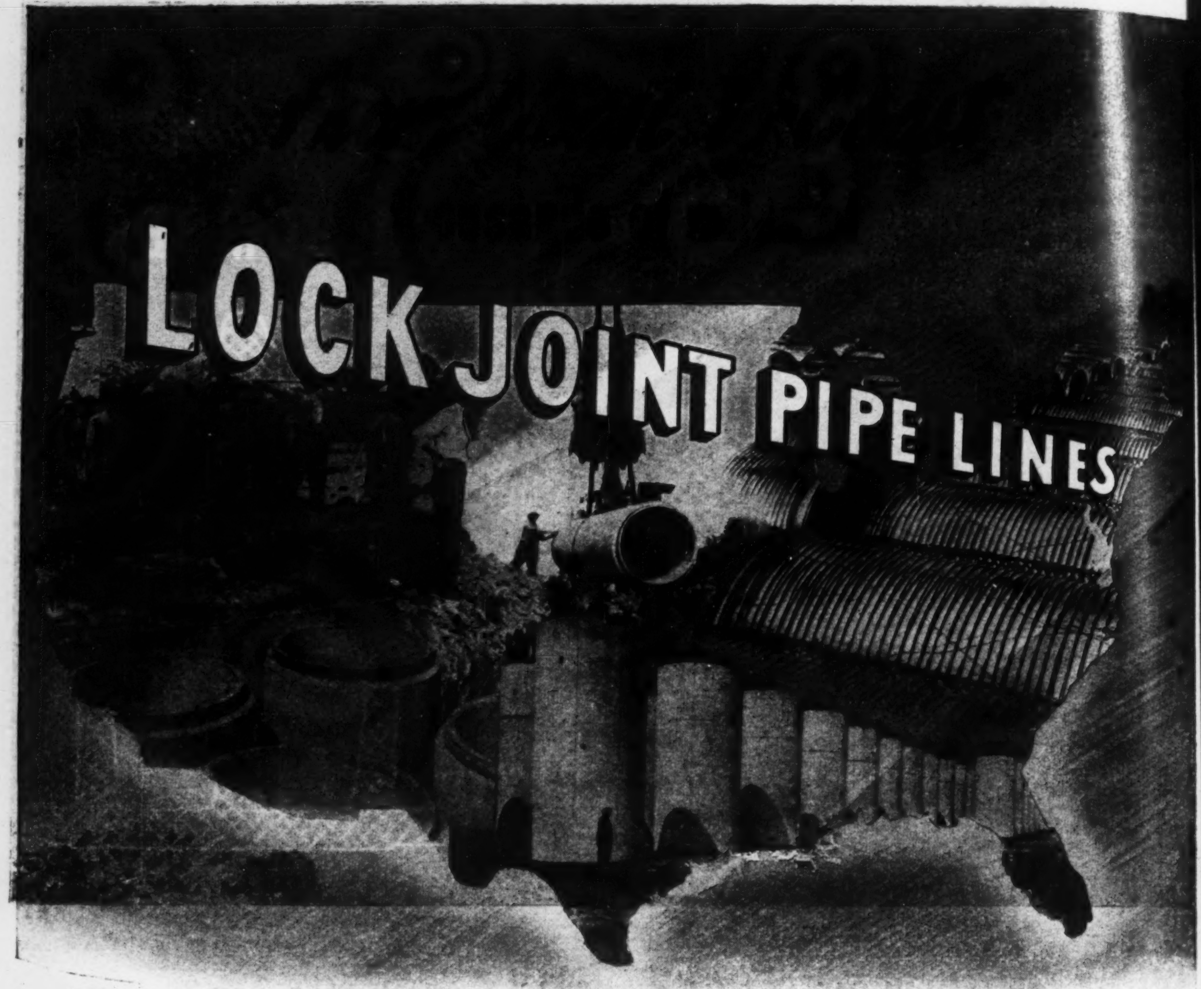
Alcoa special rolled shapes having cross sections as large as thirty square inches, and weighing 1,200 pounds per piece, have saved many a man-hour in the assembly of America's bombing planes. Actual designs are a military secret, but they approximate what you see here.

Rolled structural shapes have the distinct advantage of long lengths. This means that fewer joints are required, resulting in less dead weight and faster assembly.

This development, coming out of the war, opens up entirely new realms of design. As in our airplanes, builders of railroad cars, buses, boats and construction equipment can employ such rolled shapes. Aluminum gives lightness, sturdiness, corrosion resistance and easy fabrication. Shapes are tailored to suit stresses and other requirements.

Perhaps those wartime projects now on your drawing board can employ Alcoa Aluminum rolled structural shapes to save man power and materials. And how about your postwar designs? Alcoa engineers will gladly help you determine the facts. ALUMINUM COMPANY OF AMERICA, 2108 Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA ALUMINUM



From Portland, Maine to Oakland, California, Lock Joint Concrete Pressure Pipelines have created new high standards for water supply mains for the past 3 decades.

Leading water works engineers are definitely agreed that these highly efficient pipelines can absolutely be depended upon for strength, easy installation, adaptability, safety, high carrying capacity, water-tightness, long life and economical service.

In peacetime Lock Joint Pipelines are built with an eye to long-range programs and are recognized as the best method of constructing large diameter, high pressure water supply mains. In wartime, they offer a 25% to 75% saving of critical materials on 100% critical jobs.

The history of our many installations is the best proof of the lasting qualities built into every mile of Lock Joint Reinforced Concrete Pressure Pipe.

◆ ◆ ◆ ◆

Whether your project is large or small, for the present or the future, your 'phone call, telegram, cable or letter to any of our offices will bring a prompt reply.

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Established 1905

AMPERE, NEW JERSEY

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White Plains, N. Y. · Valley Park, Mo. · Cleveland, Ohio · Hartford, Conn. · Navarre, Ohio

SCOPE OF SERVICES *Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply Mains as well as Concrete Pipe of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous lines.*

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

Valuable cargoes handled safely with I.B. cranes

Quickly and safely, this powerful I.B. Crane raises a new born army tow boat up out of the water and onto its flat-car for delivery to a seaport. All over the world valuable products for war are being handled safely by I.B. Cranes. And it's easy to see why I.B. cranes are so universally popular.

They stand up under hard usage—seldom, if ever, requiring time out for repairs. They're powerful—handling the tough jobs with ease. They're economical—getting more work out of a gallon of fuel oil than rightfully could be expected. They're faster—speeding up material handling with magnet, hook or bucket. And their Monitor-type cabs provide 360° visibility and better ventilation.

Whether you're working for war or planning for peace-time production, it will pay you to operate Industrial Brownhoist Cranes. Industrial Brownhoist Corporation, Bay City, Michigan. Offices in New York City, Philadelphia, Pittsburgh, Cleveland and Chicago.

INDUSTRIAL BROWNHOIST BUILDS BETTER CRANES

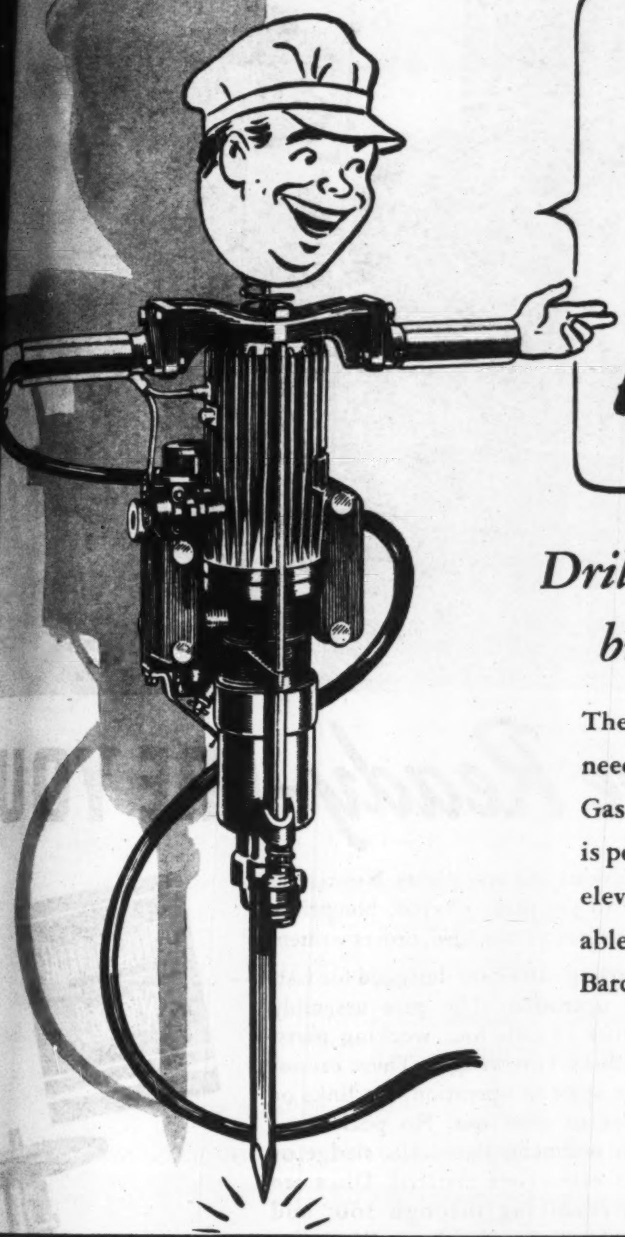
raincoats
for building
exteriors

Here is the same building before and after the application of Waterfoil . . . the raincoat for building exteriors. This scientific contribution to masonry protection has decorated and restored many valuable property investments. Waterfoil is manufactured of irreversible inorganic gels . . . non-critical materials . . . They form a hard dense protective coating bonded both chemically and physically to the masonry surface. The Waterfoil coating permits the masonry to breathe as it should, allowing water vapors to escape but impeding water absorption inwards. This helps to avoid reinforcing bar rust and spalling. The Waterfoil literature may prove very valuable to you if you are responsible for property maintenance. Send for it today.

A. C. Horn Company *established 1897*
manufacturers of materials for building construction and maintenance
Factories: Long Island City 1, N. Y. • Houston, San Francisco
branch offices in principal cities

WATERFOIL
THE UNIQUE TREATMENT FOR EXTERIOR MASONRY SURFACES

HORN



"I MAKE LIGHT WORK OF HEAVY JOBS"

Drilling, digging, driving, breaking or tamping

The tougher the job the greater your need for a low-cost Barco Portable Gas Hammer. A self-contained unit, it is portable under any conditions. With eleven special tool attachments available, you can meet any job on the spot. Barco Manufacturing Company, Not Inc.

BARCO

PORTABLE GASOLINE HAMMERS

BARCO MANUFACTURING CO., NOT INC.
1814 Winnemac Ave., Chicago 40, Ill.

Gentlemen:

Without obligation on my part please send me a copy of the BARCO HAMMER BOOKLET.

Name______________________________

Street______________________________

City________________State____________

The Valves are Ready -ARE YOU

DARLING can supply valves now for water works and sewage works replacement and improvements. Many valves are now in stock, as shown above. On other valves, deliveries are better than they have been since the beginning of the war.

Under latest WPB orders, valves and hydrants may be purchased for "maintenance" and "repair". So, if you are fighting hard-to-work, obsolete or crippled valves, put your plant in efficient working condition now.

Restrictions will be modified continuously from now on, so plan now for extensions and new plants. Now is the time to get plans okayed, blueprints made, finances arranged, orders written.

Darling valves are designed for fast, easy operation. The gate assembly consists of only four working parts, two discs, two wedges. These cannot come apart in operation. No links or guides to wear out. No pockets to catch sediment, line scale, sludge or other extraneous material. Discs are fully revolving through 360° and self-cleaning, give long life, even wear, easy operation and maintenance.

Blueprint Now—and specify Darling.

Blueprint
FOR TOMORROW'S NEEDS
Now!

TRADE
DARLING
MARK
VALVE & MANUFACTURING CO.
WILLIAMSPORT, PA.

Get in the fight with all your might!

5th WAR LOAN

D-Day has arrived at last—and our fighting men are valiantly engaged in the greatest battle in the history of the world. Now, more than ever before, it's up to each of us on the home-front to GET IN THE FIGHT and make the 5th WAR LOAN DRIVE ring the bell for Victory.

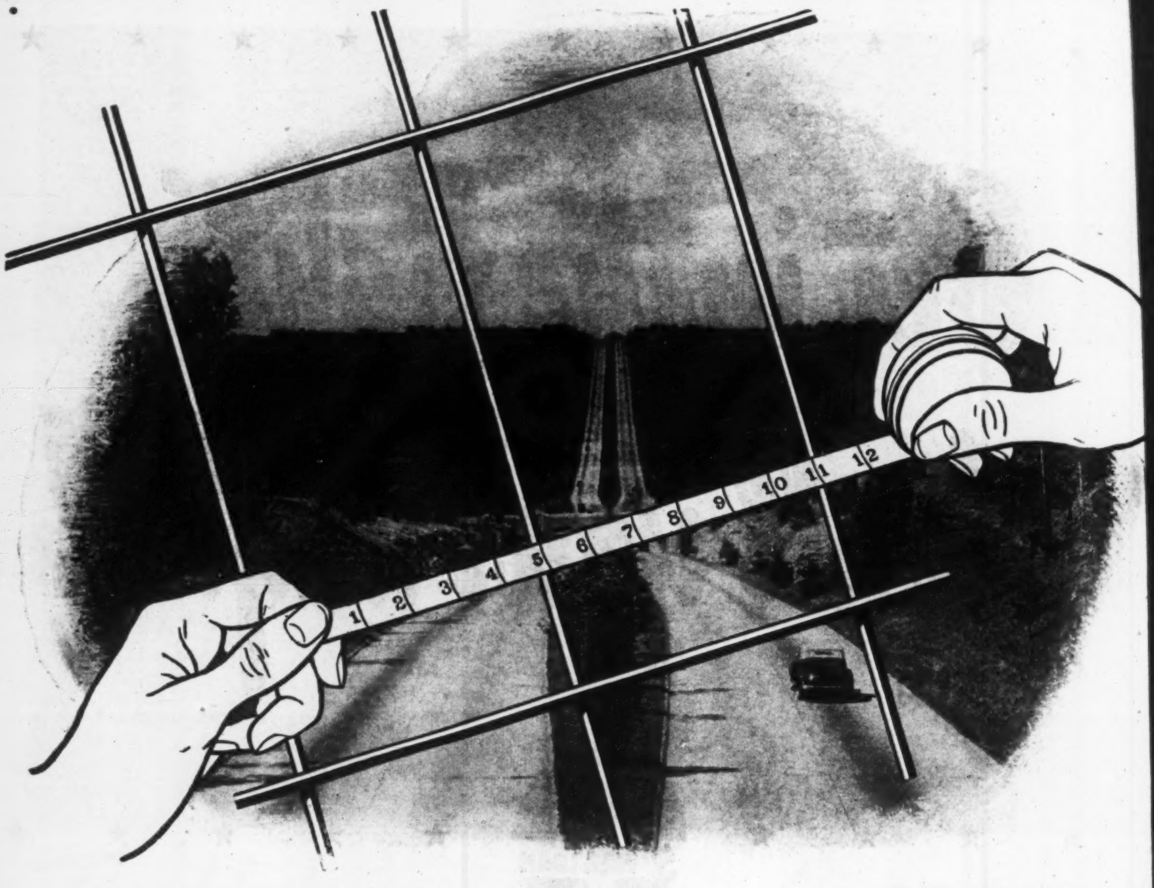
As our military effort is increasing in intensity, so must our financial support reach a new high—$16,000,000,000. We cannot fail our men on the battle-fronts . . . we must quickly raise this vital sum to back their attack. Uncle Sam is counting on everyone to buy double the extra bonds he bought last time—to put $100, $200, $500 or more in *cash* in EXTRA BONDS.

Winning this war is a tremendous task—but 130,000,000 Americans are going to see it through 100%. Do your share today!

Back the Attack

BUY MORE THAN BEFORE

RAYMOND CONCRETE PILE COMPANY • *Branch Offices in Principal Cities* • **140 Cedar Street, New York 6, N. Y.**



Consider the ECONOMY of CLINTON REINFORCING FABRIC

IN work "on location" the storing and handling of welded fabric can *cost* you money or *save* for you.

You can save time, trouble and expense on the job by specifying Clinton Reinforcing Fabric. It comes in sheets or rolls cut to your *exact* specifications, cutting handling time on the job to an absolute minimum. The UNIFORMITY and high performance standards of this fabric are well recognized. Because longitudinal and transverse wires are *electrically welded,* there are no clips or ties to break or interfere with the smooth flow of concrete around intersections.

You'll find that "placing costs" are *lower* when you use Clinton Electrically Welded Reinforcing Fabric.

Other Reasons for specifying

CLINTON WELDED FABRIC

QUALITY—Automatic machines accurately fix members at right angles to coincide with lines of stress in concrete. Perfect wire and welds assure high, *uniform* tensile strength.

CONVENIENCE—Available in a wide range of styles both in gauge and spacing. Delivered cut to size for easy storage, handling and use.

UTILITY—Used successfully and economically in every form of reinforced concrete construction.

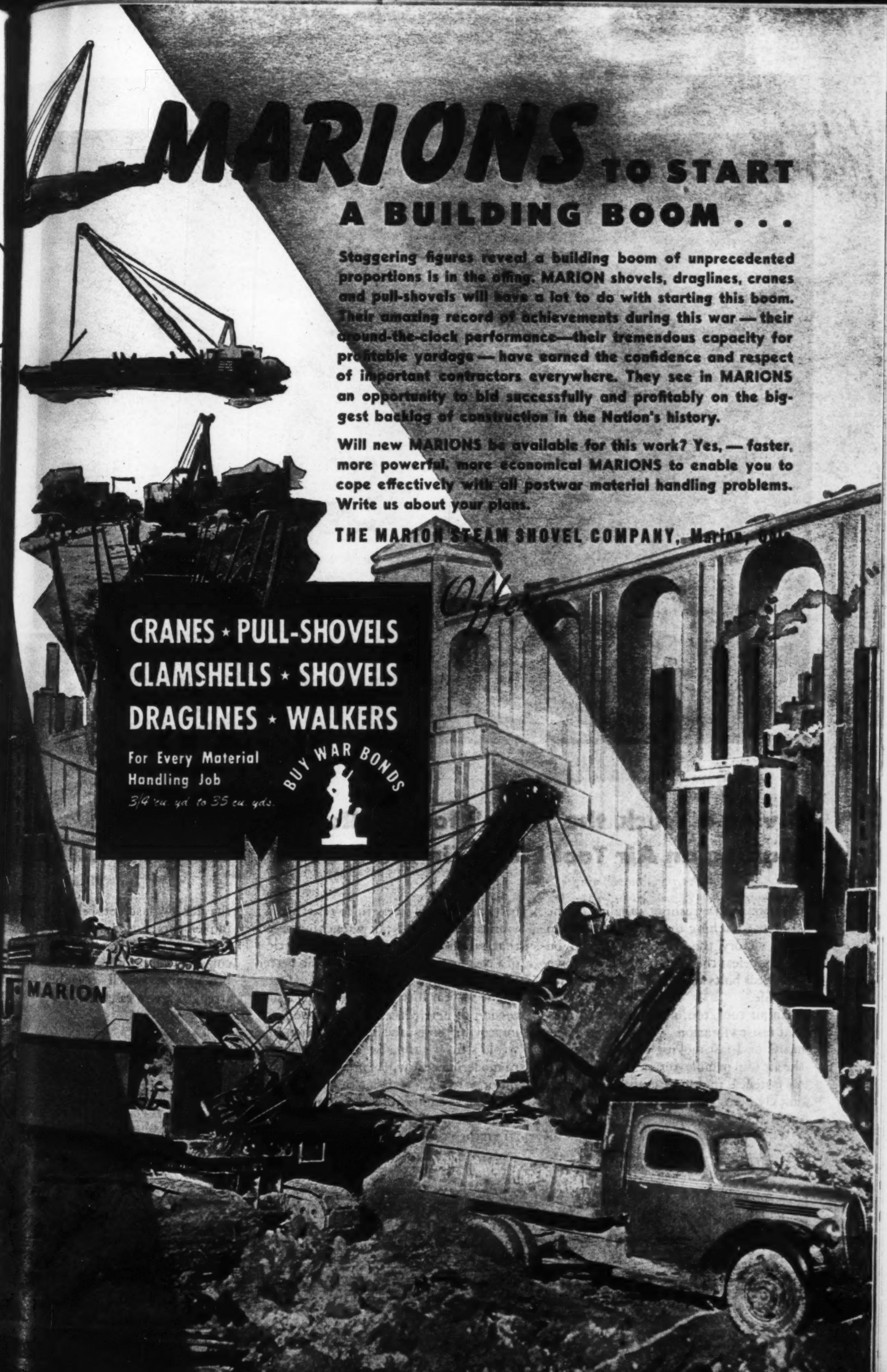
PERFORMANCE—Years of experience show that when concrete roads, sewers, runways, levees, bridges and buildings are reinforced with Clinton Fabric maintenance costs are remarkably low.

STRENGTH—Ultimate tensile strength of not less than 70,000 lbs. per sq. inch in accordance with A.S.T.M. Serial Designations A 82-34 and A 185-37.

WICKWIRE SPENCER
STEEL COMPANY
500 FIFTH AVENUE, NEW YORK 18, N. Y.
Abilene · Buffalo · Chattanooga · Chicago · Detroit · Houston
Los Angeles · Philadelphia · San Francisco · Tulsa · Worcester

WS
STANDS FOR FRIENDLINESS

MARIONS TO START A BUILDING BOOM . . .



Staggering figures reveal a building boom of unprecedented proportions is in the offing. MARION shovels, draglines, cranes and pull-shovels will have a lot to do with starting this boom. Their amazing record of achievements during this war — their around-the-clock performance—their tremendous capacity for profitable yardage — have earned the confidence and respect of important contractors everywhere. They see in MARIONS an opportunity to bid successfully and profitably on the biggest backlog of construction in the Nation's history.

Will new MARIONS be available for this work? Yes, — faster, more powerful, more economical MARIONS to enable you to cope effectively with all postwar material handling problems. Write us about your plans.

THE MARION STEAM SHOVEL COMPANY, Marion, Ohi

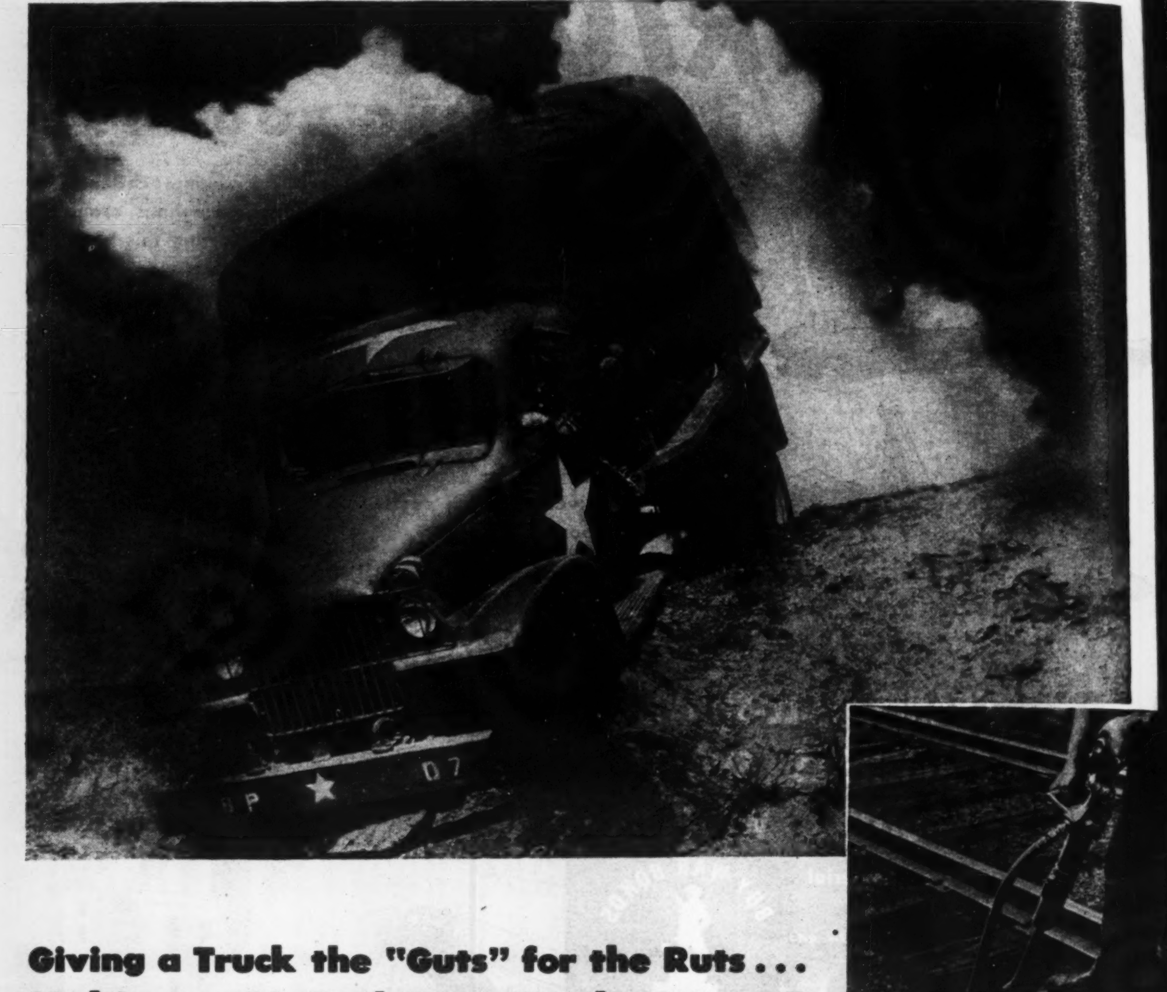
Offer

CRANES ★ PULL-SHOVELS
CLAMSHELLS ★ SHOVELS
DRAGLINES ★ WALKERS

For Every Material
Handling Job
3/4 cu. yd. to 35 cu. yds.

BUY WAR BONDS

Making strong the things that make America strong



Giving a Truck the "Guts" for the Ruts . . . Making an Air Tool Move "in the Groove"

A PRIME MOVER rushing supplies to the front . . . lurching over war-torn terrain with victory the reward of arrival on time or defeat the penalty of a breakdown . . . needs bolts and nuts that hang on for dear life.

An air tool, too, needs bolts and nuts that resist vibration . . . but the requirements of a fast-moving assembly line in the air tool manufacturers' plant also call for fasteners that mate easily, tighten up quickly, keep production rolling full speed ahead.

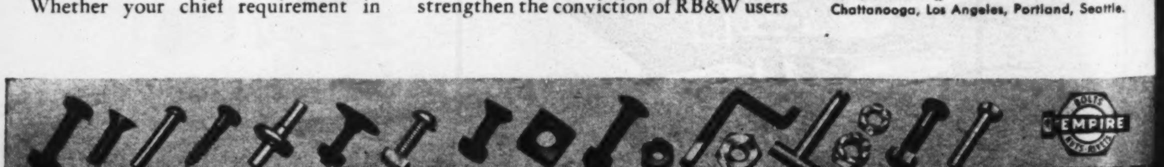
Whether your chief requirement in bolts and nuts is strength to resist stress, vibration and shock; or wrenching speed that satisfies the time-clocking scrutiny of a cost accountant . . . you can do better fastening with RB&W EMPIRE products.

The 99-year history of RB&W is a succession of new process developments for improving bolts and nuts . . . from the world's first automatic cold header . . . to modern metal-working techniques for incorporating greater accuracy and strength and improved appearance.

Further developments now planned will strengthen the conviction of RB&W users that RB&W fasteners belong in their fa
implements, automobiles, railroads,
craft, power and transmission equipme
construction projects or general indust
products in which assembly speed a
strength are so essential.

RB&W

Russell, Burdsall & Ward Bolt and Nut Compa
Factories at: **Port Chester, N. Y., Coraopolis, Pa.,**
Falls, Ill. ***Sales offices at:*** **Philadelphia, Detroit, Chic**
Chattanooga, Los Angeles, Portland, Seattle.



RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

You can buy Engines proved in Hell ——

NEW POWER
FOR A
NEW WORLD

ng engines are now being tested for
post-war assignments on the toughest
ing grounds of all times—the fighting
s of the world. They are powering the
e craft of the Allied navies and armies.

war has taught us to build Sterling en-
s that better meet the needs of a wide
e of applications in the industrial as well
e marine fields. Now these engines give
ter horsepower per pound of weight and

give more economical operation than ever before. And still they are precision-built.

Write us and we shall be glad to put at your disposal immediately the technical ability of Sterling engineers and the invaluable experience of practical field men to help you replace immediately your overworked stationary and stand-by engines.

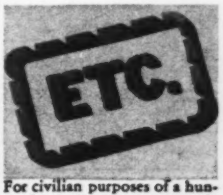
Sterling Engine Company, Buffalo, N. Y.
Offices in New York, Washington, Chicago.

l for America comes from
es ventilated by fans
rated by Sterling driven
erator units.

"Black Gold" is lifted 15,000 feet or more from out of the ground with pumps powered by Sterling engines.

Mountain streams forced by Sterling driven pumps turn deserts into fertile and profitable productive farm lands.

When disaster strikes, Sterling engines are immediately on the job to supply stand-by power in any emergency.



For civilian purposes of a hundred sorts Sterling can provide engines greatly improved over former pre-war design.

STERLING ENGINES

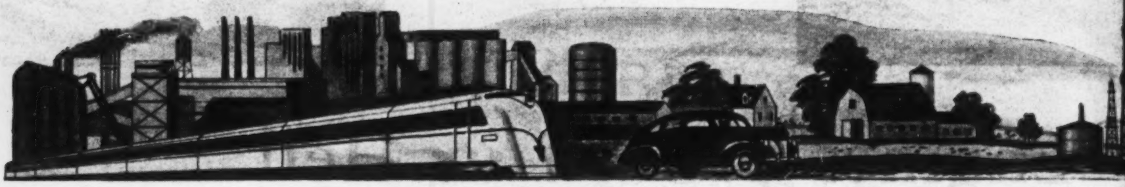
GASOLINE DIESEL GAS

EEP BUYING WAR BONDS"

On the Far-Flung Battle Fron

of the world, millions of Hyatt Roller Bearin are doing their jobs consistently well...carryi the bearing loads of tanks, planes, guns, ships, trucks, and tractor bulldozers.

On the Home Front, too,



Hyatt continues to serve America...on railwa and highway and farm, in mill and factory. wherever wheels and shafts turn for victor

Hyatt Roller Bearings are built to last...with minimum care. But don't forget to give them the proper attention all precious anti-friction bearings deserve today.

HYATT BEARINGS

Division of GENERAL MOTORS

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSE

Hats off to the men of Steel!

When victory comes, it will be won by fighting men – men superbly trained and armed to the teeth with weapons of the finest steel ever made.

In helping to forge this "ring of steel" around our enemies, the men of this nation's great steel industry have performed a production miracle without parallel in history.

★ They have set an all-time steelmaking record . . . nearly 90 million tons a year . . . almost double the yearly average of World War I.

★ They have moved vast mountains of iron ore from the mines of Minnesota to the mills of Pennsylvania.

★ They have created new steels of greater strength and better quality than were ever dreamed possible.

★ They have developed new products of steel to give our arms the greatest range and striking power on earth.

In this record, round-the-clock service of an industry that knows no rest, thousands of Jenkins Valves have been required to meet tests of strength and endurance far beyond any ever imposed by peacetime operation. Here, as in equally rigorous service for other vital war industries, their remarkable performance has added new force to the long-established rule that *"it pays to standardize on Jenkins"!*

Jenkins Bros., 80 White Street, New York 13; Bridgeport; Atlanta; Boston; Philadelphia; Chicago. Jenkins Bros., Ltd., Montreal; London.

TRADE JENKINS MARK

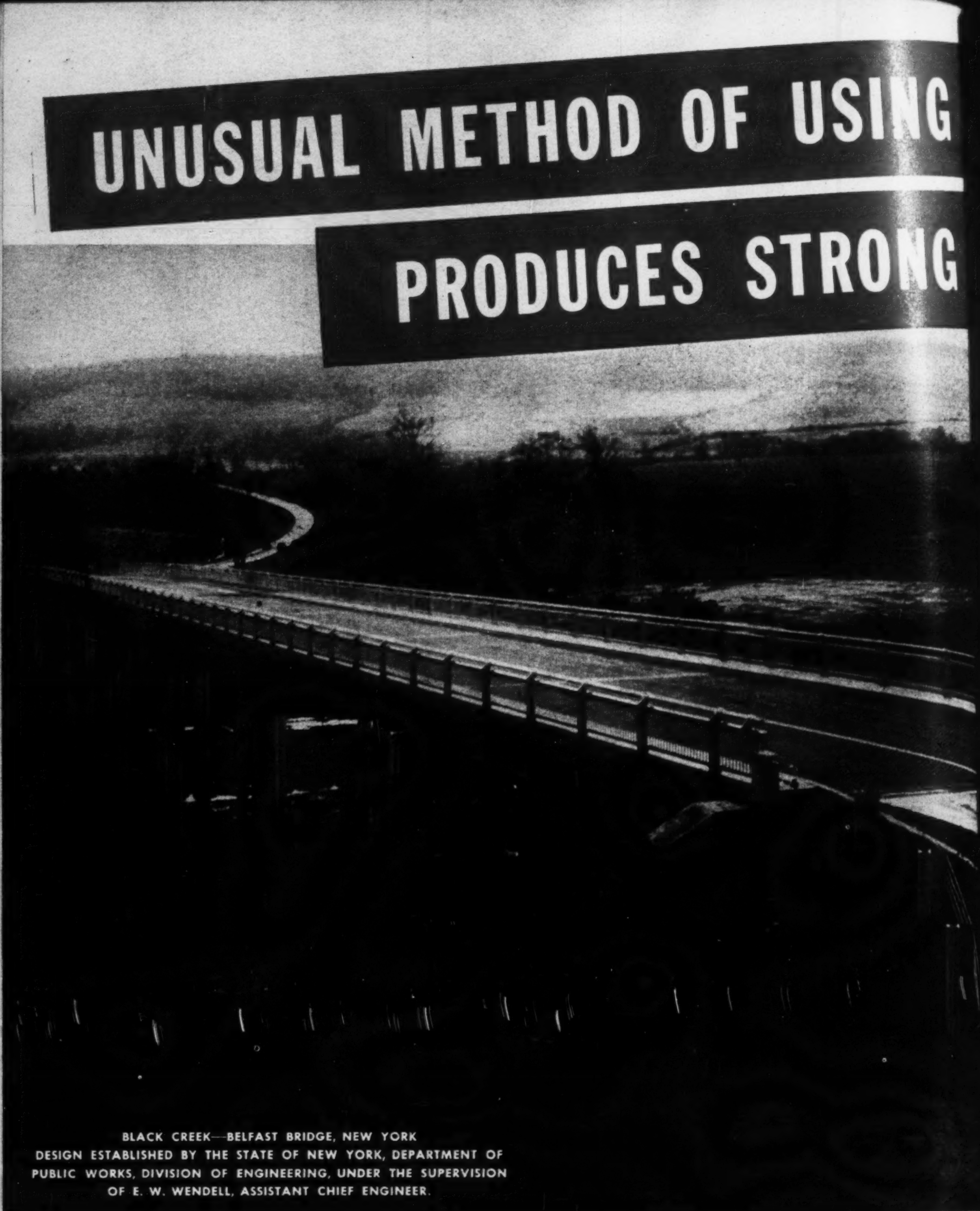
Jenkins Bros.

JENKINS VALVES

SINCE 1864

For every industrial, engineering, marine and plumbing-heating service . . . in Bronze, Iron, Cast Steel and Corrosion-Resisting Alloys . . . 125 to 600 lbs. pressure.

UNUSUAL METHOD OF USING
PRODUCES STRONG



BLACK CREEK—BELFAST BRIDGE, NEW YORK
DESIGN ESTABLISHED BY THE STATE OF NEW YORK, DEPARTMENT OF PUBLIC WORKS, DIVISION OF ENGINEERING, UNDER THE SUPERVISION OF E. W. WENDELL, ASSISTANT CHIEF ENGINEER.

NATIONAL PIPE PILES replace piers in this grade elimination project in New York State. Much time and expense are saved with this simplified design.

USS

UNITED

STEEL PIPE PILING

BRIDGES *at low cost!*

THIS unusual bridge design uses NATIONAL Seamless Pipe Piles to obtain maximum strength at minimum cost. The installation presented a difficult foundation situation where the terrain was in movement for a considerable depth. Many other types of design were considered but seamless steel piling was established as the most desirable. There are a total of 8 spans in the project. One 79-foot span is over an adjacent creek. Two 82-foot spans cross the railroad and the others are all 56 feet long. The piles extend an average of 30 feet above ground to support the bridge structure.

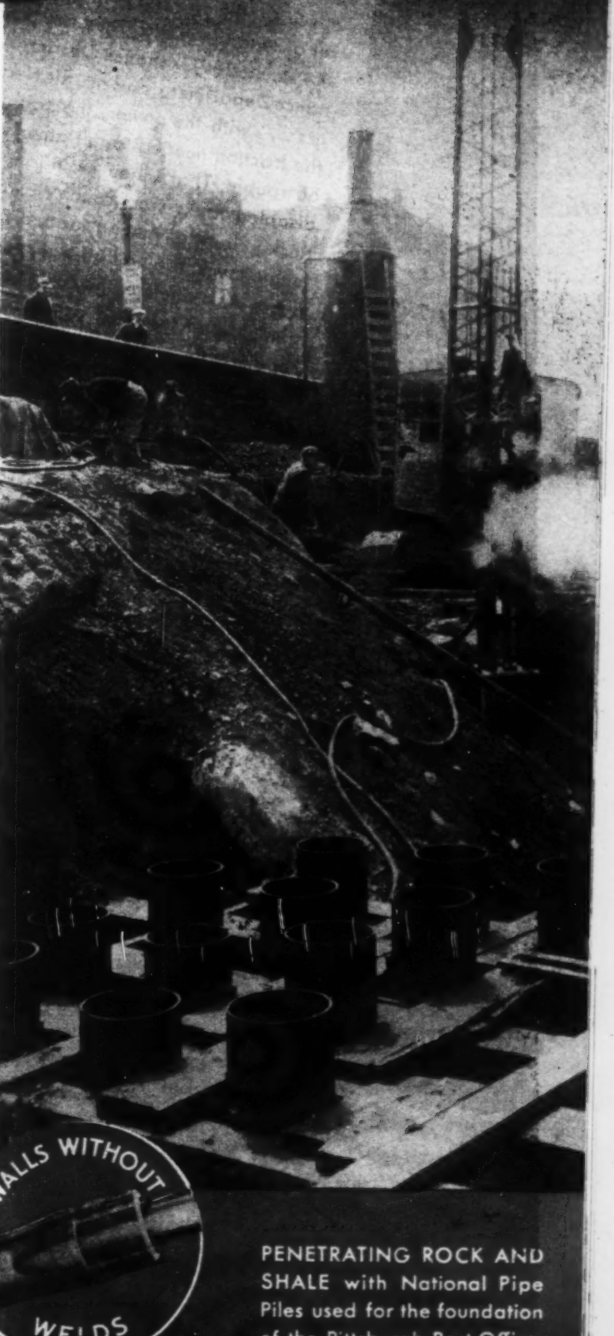
The NATIONAL Pipe Piles are 24-inch Seamless Pipe. They were driven without trouble and have proved highly satisfactory.

Seamless Pipe Piling has four definite advantages:

1. **It penetrates where other piling fails.**
2. **It has greater supporting strength.**
3. **It costs less than caisson work.**
4. **It can be inspected full length after driving by lowering a light inside the pipe.**

In New York City pipe piling was used for many of the largest and most difficult engineering jobs. The West Side Express Highway is a typical example where NATIONAL Seamless Pipe Piles were driven to depths up to 185 feet. The going was tough—through stone-filled cribbing, sunken barges, and rock fill. More than 17 miles of steel pipe piles were successfully used on this project. Pipe piles have proved equally satisfactory for skyscrapers, super-highways, docks, bridges, and radio towers.

If you are planning postwar jobs now involving the use of piling, our engineers will gladly assist you in determining the most effective use of tubular steel piles.



WALLS WITHOUT WELDS

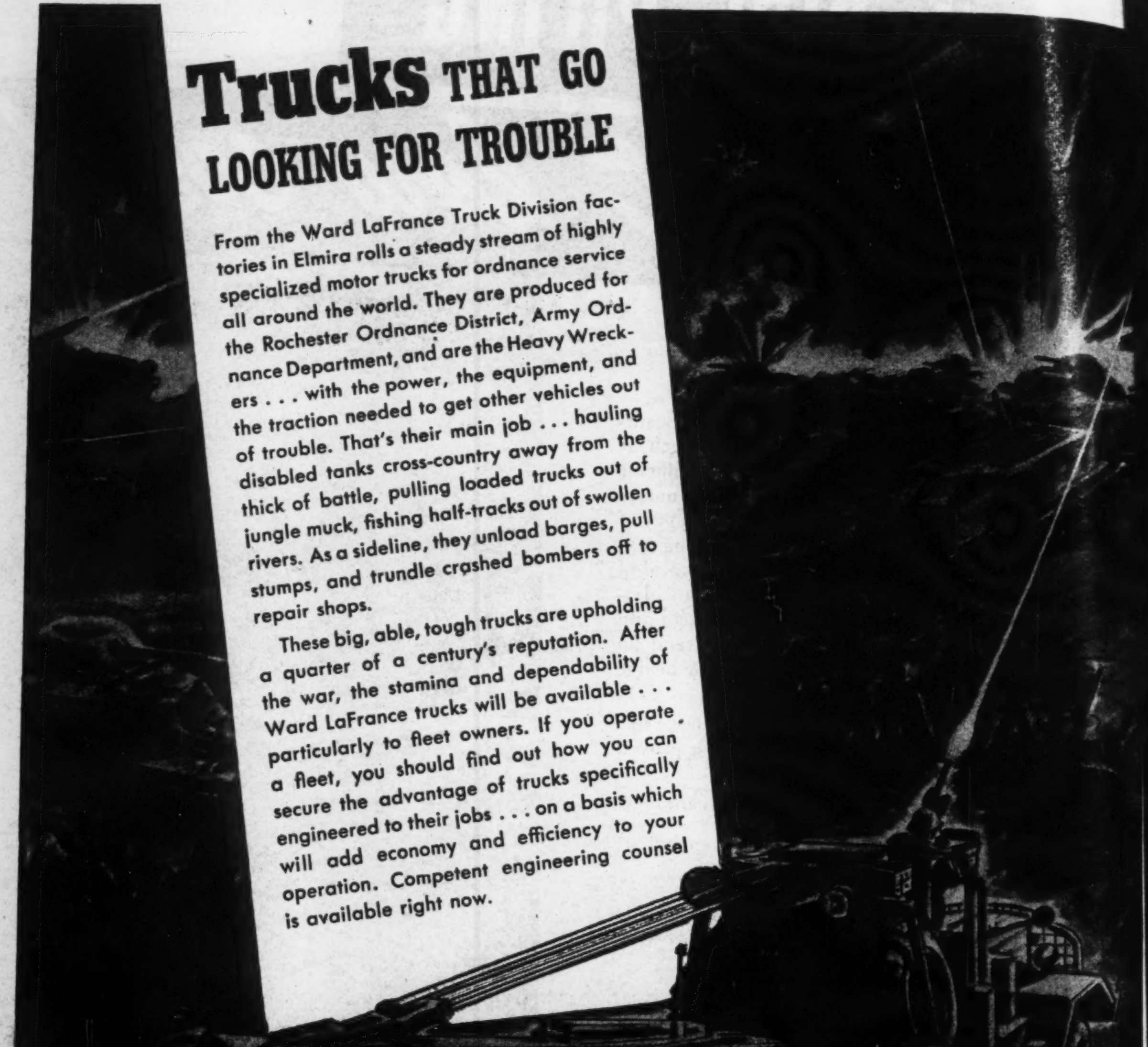
PENETRATING ROCK AND SHALE with National Pipe Piles used for the foundation of the Pittsburgh Post Office.

NATIONAL TUBE COMPANY

Pittsburgh, Pa.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
United States Steel Export Company, New York

STATES STEEL



Trucks THAT GO LOOKING FOR TROUBLE

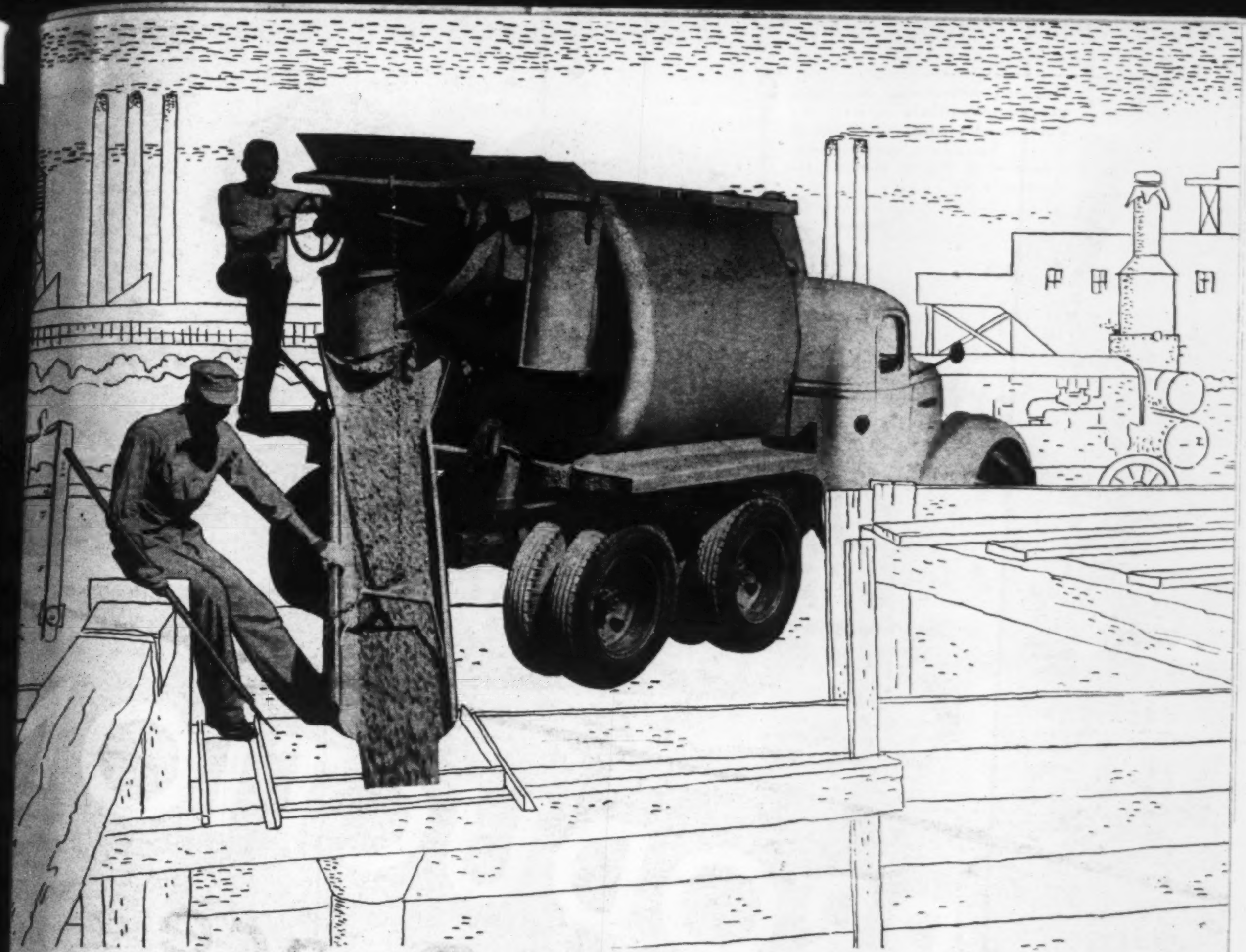
From the Ward LaFrance Truck Division factories in Elmira rolls a steady stream of highly specialized motor trucks for ordnance service all around the world. They are produced for the Rochester Ordnance District, Army Ordnance Department, and are the Heavy Wreckers . . . with the power, the equipment, and the traction needed to get other vehicles out of trouble. That's their main job . . . hauling disabled tanks cross-country away from the thick of battle, pulling loaded trucks out of jungle muck, fishing half-tracks out of swollen rivers. As a sideline, they unload barges, pull stumps, and trundle crashed bombers off to repair shops.

These big, able, tough trucks are upholding a quarter of a century's reputation. After the war, the stamina and dependability of Ward LaFrance trucks will be available . . . particularly to fleet owners. If you operate a fleet, you should find out how you can secure the advantage of trucks specifically engineered to their jobs . . . on a basis which will add economy and efficiency to your operation. Competent engineering counsel is available right now.

WARD LaFRANCE

TRUCK DIVISION

GREAT AMERICAN GAI **INDUSTRIES, INC.**
Elmira **New York**



t's "Cushioned" to cut maintenance costs!

YOU can forget about the dangers of road shocks—of weaving and sidesway—the strains of quick tarts and stops with a fully loaded drum—*if* your truck nixer is a Rex.

For the drum of a Rex Moto-Mixer rides on a ushion . . . the exclusive chain belt drive that absorbs ll shocks and stresses. There are no unyielding gears nd pinions to transmit damaging shocks directly to he costly transmission and power plant.

Many Moto-Mixer owners say this one feature alone s enough to make Rex their choice . . . that their maintenance costs are practically limited to greasing and cleaning.

And there are other advantages you get with Rex and Rex only. You get 100% accurate water system; 5-in-1 Quint Spout; the exclusive Rex Hi-Lo Mixing action; the Rex end-charging hopper; revolutionary visible mixing; Rex unrestricted discharge; and many others.

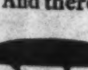
• • •

FOR INFORMATION on Rex Moto-Mixers, send for your copy of Bulletin No. 405. And check the other Rex construction equipment: Mixers, to cut concrete placing costs; Pavers, that can give you really heavy yardage production, faster; Pumpcretes, that pump concrete by pipeline . . . Pumps, that move water economically and efficiently. See your Rex Distributor, or write direct to Chain Belt Company, 1633 West Bruce Street, Milwaukee 4, Wisconsin.

CHAIN BELT COMPANY *of Milwaukee*

REX

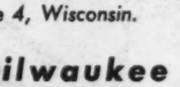
CONSTRUCTION MACHINERY



PUMPS

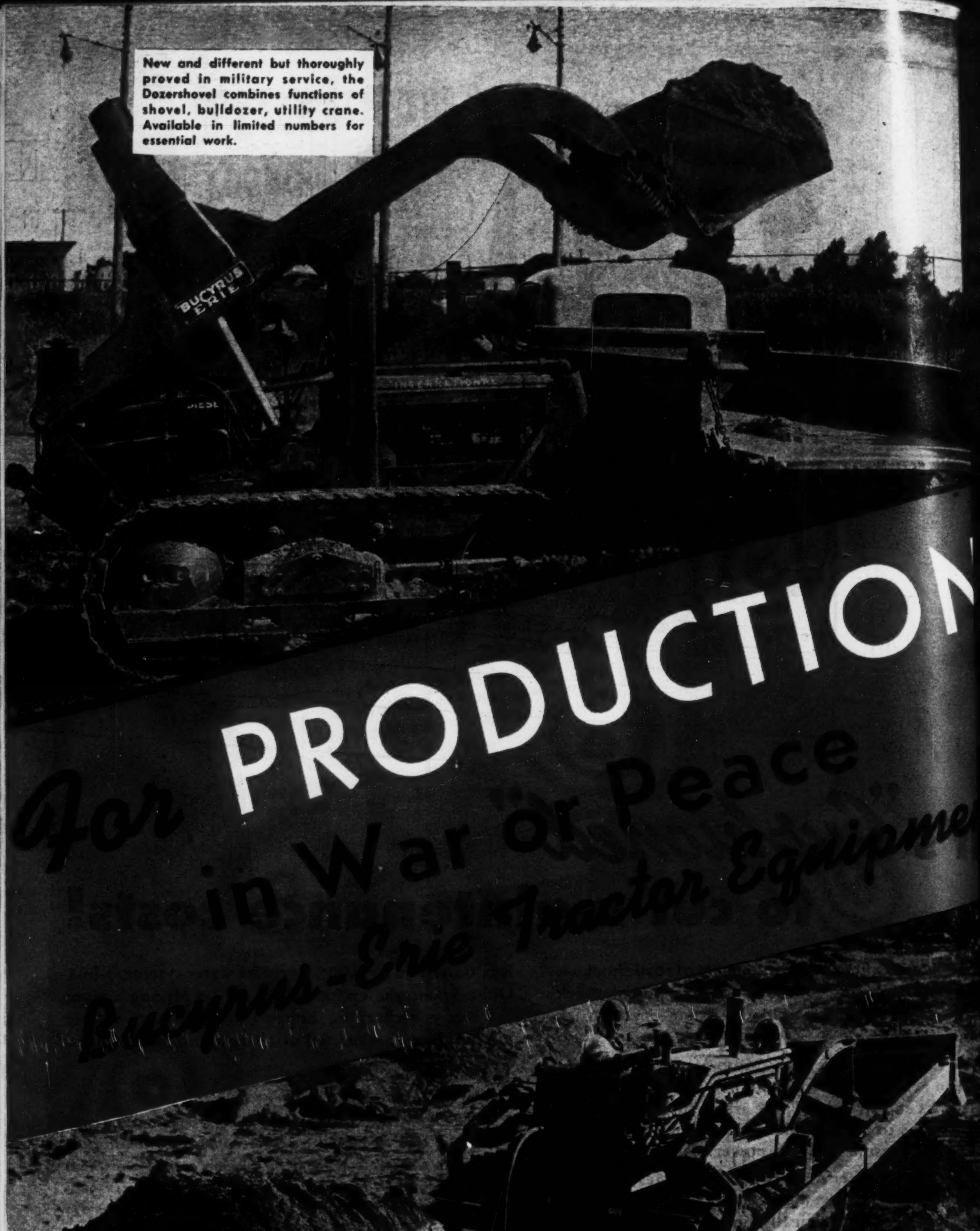
PAVERS

PUMPCRETES



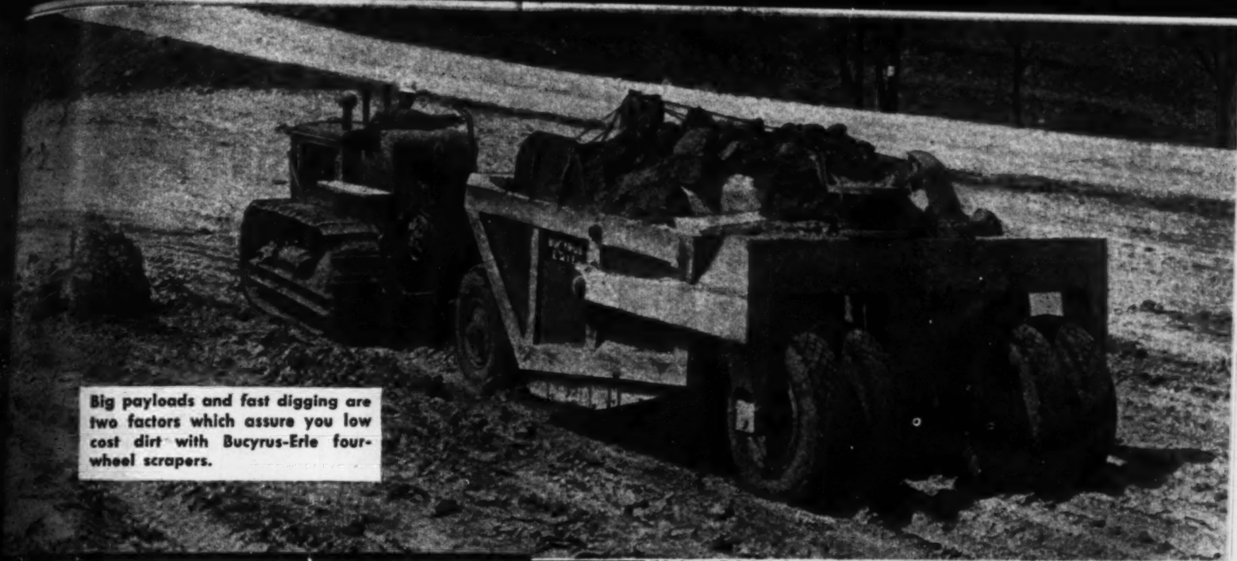
MOTO-MIXERS

MIXERS


For PRODUCTION
in War or Peace
Bucyrus-Erie Tractor Equipmen

New and different but thoroughly proved in military service, the Dozershovel combines functions of shovel, bulldozer, utility crane. Available in limited numbers for essential work.

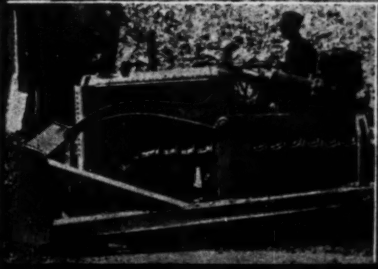
A one-man road maintenance crew, this Bucyrus-Erie Bullgrader-scraper dual unit will improve and maintain many miles of road per dollar of tax revenue.


Big payloads and fast digging are two factors which assure you low cost dirt with Bucyrus-Erie four-wheel scrapers.

The heat of wartime construction is still on, and prospects are bright for extensive building in the postwar period, too. To get maximum production now and the most in profits when peace returns, you need equipment that can deliver big output and stand the gaff.

Bucyrus-Erie's war experience added to that gained in more than sixty years in the dirt-moving game has produced tractor equipment that is tops in materials, design, and workmanship. That's why, when you buy Bucyrus-Erie tractor equipment you get the toughest, most productive units on the market. It's the kind of unit you need for wartime road construction now, and it's this kind you'll have to have for big profits after the war.

Let your International TracTracTor Distributor tell you about the complete line of Bucyrus-Erie tractor equipment.


Hydraulic Bulldozers

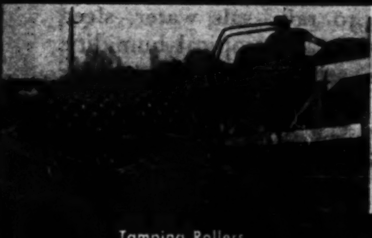
Hydraulic Bullgraders

Power Control Units

Cable Rippers

Rotary Rippers

Tractor Cabs

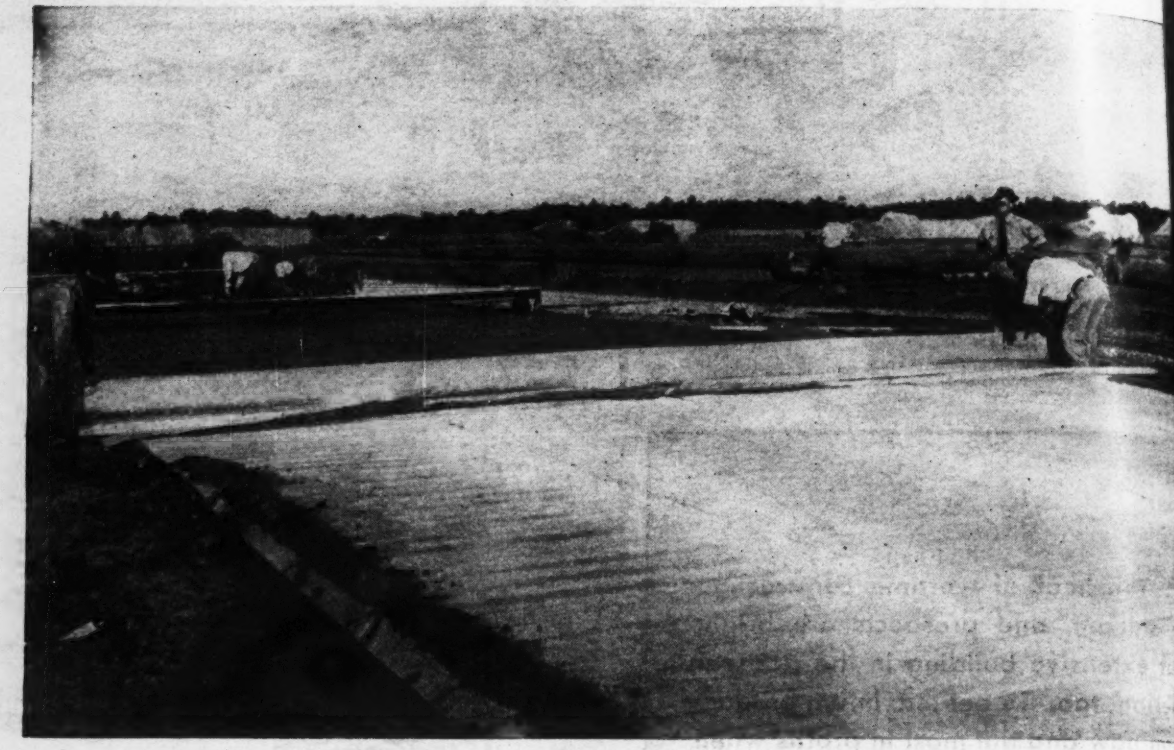

Tamping Rollers

Back-Dump Scrapers

BUCYRUS ERIE
TRACTOR EQUIPMENT

SEE YOUR
INTERNATIONAL TRACTRACTOR
DISTRIBUTOR

tain many miles of road per dollar of tax revenue.



SĪSALKRAFT As It Was . . . and As It Will Be, When Victory is Won!

Five hundred SISALKRAFT Blankets were used on this prewar concrete job — each blanket 28½ x 60 ft.!

Tough, weather-resistant and scuff proof, SISALKRAFT blankets have been used and re-used — then put to further use in protecting sub-grade and materials. Their usefulness doesn't "wear out".

Those very same qualities that made SISALKRAFT the preferred concrete curing agent are the reasons why it is now protecting war supplies enroute to fighting fronts.

Directly exposed to rain, salt water, sleet, freezing temperature and tropical humidity, SISALKRAFT is setting new records for toughness, weather resistance and endurance under the most severe conditions.

For over 24 years SISALKRAFT served the construction industry as dependable protection for newly poured concrete and materials and equipment stored in the open.

Specified by the Highway Departments of 40 states, SISALKRAFT set new standards in curing concrete roads and runways. On millions of yards of paving, from coast to coast, it proved its unmatched ability to prevent quick evaporation from newly poured concrete. Its low cost was an added factor of importance.

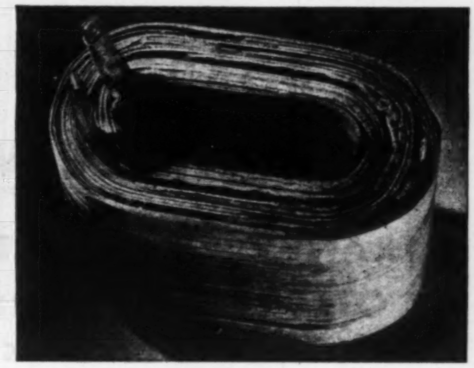
When Victory is won, SISALKRAFT will again be available for peacetime uses — with a war record of amazing performance that proves beyond question its unmatched toughness and weatherproof qualities. Write it into your plans!

THE SĪSALKRAFT CO.
205 W. WACKER DRIVE · CHICAGO 6, ILL.
NEW YORK · SAN FRANCISCO · LONDON · SYDNEY

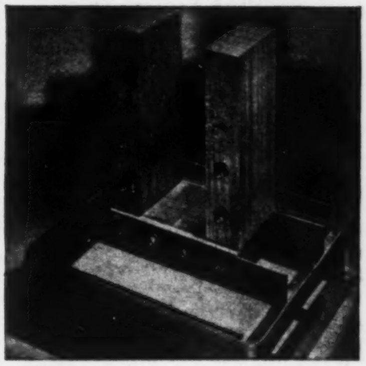
Manufacturers of SISALKRAFT, FIBREEN, SISAL-X, SISALTAPE AND COPPER-ARMORED SISALKRAFT

GET FINER AND FASTER A. C. WELDING WITH AMPAC "400"

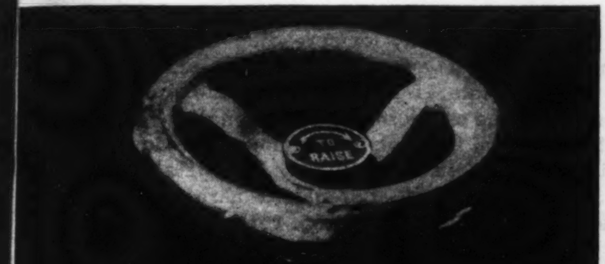
1 Revolutionary new patented circuit *increases* efficiency — *cuts* idling loss! Entire construction is *simple, rugged!*



2 Transformer coil uses *rectangular* copper — glass-insulated — with primary over secondary. Air duct between windings dissipates heat — *prevents* breakdown!



3 Sturdy lower core is 1-piece, U-shaped . . . of die-punched silicon steel. Insures quiet operation . . . with *no* power-wasting air gaps!



6 Power regulation is *smooth — quick — simple!* One-inch movement of upper core covers entire welding range — 50 to 500 amps — in *seven turns* of control wheel. Cuts adjustment time to *minimum*. Speeds welding! A 1677

4 Here's typical Ampac quality — a big, tough, *extra heavy* welding terminal. Note *brazed* connections!

5 Hardened brass guide is simple, fool-proof! Channel shape provides *extra* strength.

GET COMPLETE FACTS on this brilliantly engineered a.c. welder from your nearby Ampac dealer or Allis-Chalmers district office. Ask for bulletin B6302. For data on new Ampac "200" welder, ask for bulletin B6241.

ALLIS-CHALMERS

MILWAUKEE, WISCONSIN

". . . for High Spee

KNOW YOUR BLAW-KNOX DISTRIBUTOR

ALABAMA
Birmingham — Standard Con. Supply Co.
ARIZONA
Phoenix — State Tractor Equipment Co.
ARKANSAS
Little Rock — Lynne Machinery Company
CALIFORNIA
Los Angeles — Le Roi-Rix Machinery Co.
E. M. Ornitz
San Francisco — C. H. Grant Company
COLORADO
Denver — Ray Corson Machinery Co.
CONNECTICUT
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DELAWARE
Philadelphia, Pa. — Giles & Ransome
DISTRICT OF COLUMBIA
Washington — Matt A. Dostach Mach. Co.
FLORIDA
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Miami — Florida Equipment Company
Tampa — Epperson & Company
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IDAHO
Boise — Intermountain Equip. Co.
ILLINOIS
Chicago — O. T. Christenson Co.
St. Louis, Mo. — O. B. Avery Company
INDIANA
Indianapolis — Reid-Holcomb Co.
Chicago, Ill. — O. T. Christenson Co.
Louisville, Ky. — Brandeis Machinery & Supply Co.
IOWA
Davenport — Giesche-Robinson Co.
Des Moines — Herman M. Brown Co.
KANSAS
Kansas City — G. W. Van Keppel Co.
KENTUCKY
Louisville — Brandeis Mach. & Supply Co.
LOUISIANA
New Orleans — Southern States Equip. Co.
MAINE
Portland — Stanley-Cadigan Company
MARYLAND
Baltimore — Henry H. Meyer Co., Inc.
MASSACHUSETTS
Boston — The Equipment Company
New Haven, Conn. — W. I. Clark Co.
MICHIGAN
Detroit — Wm. F. Favorite Company
Grand Rapids — Contractors Mach. Co.
Iron Mountain — Service & Supply
Division of Lakeshore Engineering Co.
MINNESOTA
Duluth — Borchert-Ingersoll, Inc.
St. Paul — Borchert-Ingersoll, Inc.
MISSISSIPPI
Amory — Dalrymple Equip. Co.
New Orleans, La. — Southern States Equipment Co.
MISSOURI
Kansas City — G. W. Van Keppel Co.
St. Louis — O. B. Avery Company
MONTANA
Billings — Western Const. Equip Co.
NEBRASKA
Omaha — Anderson Equipment Co.
NEVADA
Los Angeles, Cal. — E. M. Ornitz
San Francisco, Cal. — C. H. Grant Co.
NEW HAMPSHIRE
Barre, Vt. — Casellini-Venable Corp.
Boston, Mass. — The Equipment Co.
Portland, Me. — Stanley-Cadigan Co.
NEW JERSEY
New York, N. Y. — R. E. Brooks Company
Philadelphia, Pa. — Giles & Ransome
NEW MEXICO
Albuquerque — Hardin & Coggins
NEW YORK
Albany — Larkin Equipment Co.
Buffalo — Trever Corporation
Elmira — LeValley, McLeod & Kinkaid
Endicott — Nowing Motors Co., Inc.
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Syracuse — Syracuse Lumber Co.
Utica — McQuade & Bannigan, Inc.
NORTH CAROLINA
Raleigh — Carolina Tractor & Equip Co.
Salisbury — Carolina Tractor & Equip Co.
NORTH DAKOTA
Fargo — Dakota Tractor & Equipment Co.
OHIO
Cleveland — H. B. Fuller Equipment Co.
Columbus — W. W. Williams Co.
OKLAHOMA
Tulsa — Leland Equipment Co.
OREGON
Portland — Contractors Equipment Corp.
PENNSYLVANIA
Philadelphia — Giles & Ransome
Pittsburgh — Dravo-Doyle Company
RHODE ISLAND
Boston, Mass. — The Equipment Co.
SOUTH CAROLINA
Columbia — Jeff Hunt Road Machinery Co.
SOUTH DAKOTA
Rapid City — I. D. Evans Equip. Co.
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Chattanooga — Nixon-Hasselle Co.
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Memphis — Road Bldrs. Equip. Co.
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Dallas — Conley-Lott-Nichols Mach. Co.
Houston — R. B. Everett & Co.
UTAH
Salt Lake City — Lund Machinery Co.
VERMONT
Barre — Casellini-Venable Corp.
VIRGINIA
Richmond — Rish Equip. Co.
Roanoke — Roanoke Tractor & Equip. Co.
WASHINGTON
Seattle — Star Machinery Co.
Spokane — Empire Equipment Company
WEST VIRGINIA
Charleston — Charleston Tractor & Equip. Corp.
Clarksburg — Rish Equip. Co.
WISCONSIN
Milwaukee — Hunter Tractor & Mach. Co.
WYOMING
Billings, Mont. — Western Construction Equipment Co.
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ALASKA
Seattle, Wash. — Northern Commercial Co.
CANADA
Halifax, N. S. — Coleman Mach. Co., Ltd.
Montreal — Watson Jack & Co., Ltd.
Toronto — W. L. Ballentine Co.
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Winnipeg — Kane Tractor & Equip. Co.
Saskatoon — Richardson Road Mach. Co., Ltd.
NEW FOUNDLAND
St. Johns — Dominion Dist. Co.

ON ROADS AND AIRPORTS USE THE BLAW-KNOX

TRANSVERSE BLADE AUTOMATIC CONCRETE PAVING SPREADER

AND THE

BLAW-KNOX FINISHING MACHINE

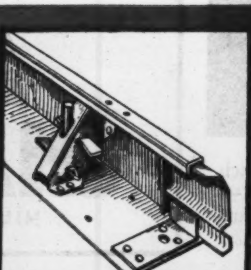
(EITHER MACHINE EQUIPPED WITH PAVING VIBRATOR IF DESIRED)

● Contractors prefer the Blaw-Knox Transverse Blade Spreader because of its enormous capacity for spreading concrete ahead of the finishing machine — its automatic spreading action regardless of where the concrete is placed on the subgrade — the absence of pressure on the side forms and avoidance of disturbing form alignment — freedom from job-interrupting breakdowns and excessive maintenance costs — does not segregate concrete regardless of maximum size of aggregate — narrow machines are convertible to wider machines and vice-versa.

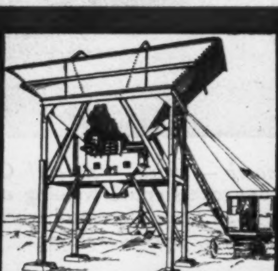
● Contractors also prefer the Blaw-Knox Finishing Machine because of the smooth finish obtained under maximum production conditions — wide screed ends prevent wastage of concrete over side forms — six traction speeds and four screed speeds for flexibility of operation to handle varying types of concrete — machine is easily and quickly adjustable for width — proper weight distribution makes machine easy on the side forms and easy to steer — low upkeep cost — easy to operate.

● The combination of the Blaw-Knox Finishing Machine and Transverse Blade Spreader has the capacity to handle the maximum output of two 34-E Dual Drum Pavers.

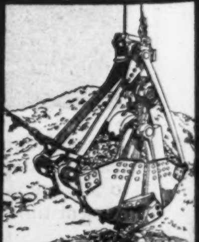
● See your nearest Blaw-Knox distributor about Blaw-Knox Finishing Machines and Blaw-Knox Transverse Blade Automatic Concrete Paving Spreaders for your next paving job.



PAVING FORMS FOR AIRPORTS AND ROADS

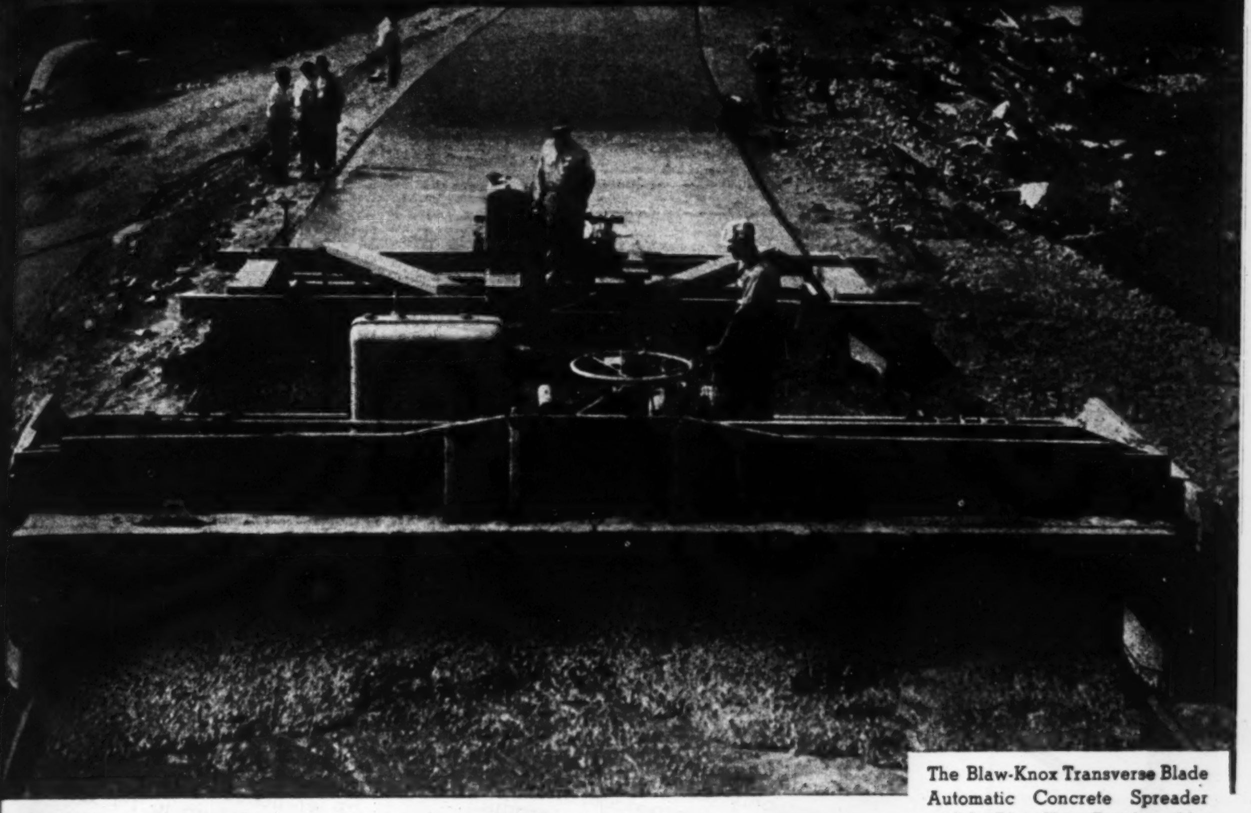


AGGREGATE BATCHING PLANTS



CLAMSHELL BUCKETS

Quality Paving Production



The Blaw-Knox Transverse Blade Automatic Concrete Spreader and the Blaw-Knox Finishing Machine illustrated are paving the Queens Highway — the main east and west route in Ontario, Canada. The old pavement had disintegrated under heavy war traffic. Both machines are adjustable from 20 to 25 ft. widths. Photo shows paving operations on super elevated curve, 22 ft. width of slab.

Pick for your job the machines that have made good on the world's toughest proving grounds, paving air bases and roads for the armed forces on every front.

New points in design and construction, war inspired, will be found in the Blaw-Knox construction equipment you'll be using for post-war construction.

BLAW-KNOX

BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
2001 Farmers Bank Bldg., Pittsburgh, Pa.
NEW YORK · CHICAGO · PHILADELPHIA
BIRMINGHAM · WASHINGTON
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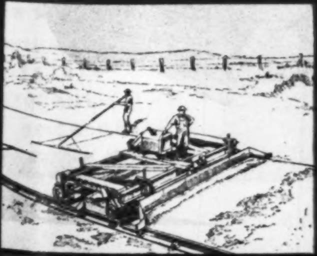
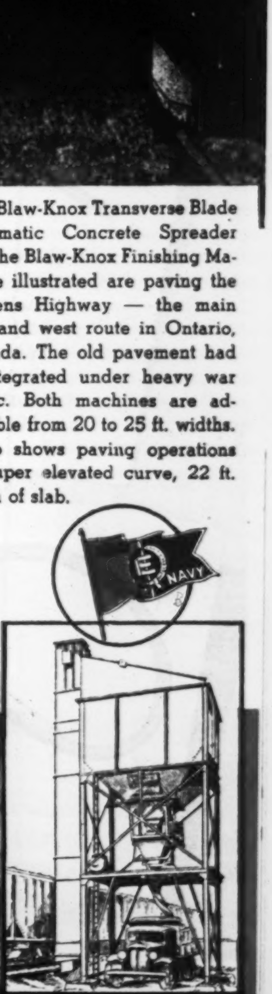


FINISHING MACHINES FOR AIRPORTS AND ROADS

SHEEPSFOOT TAMPING ROLLERS

CONCRETE BUCKETS



BULK CEMENT PLANTS

Every type of time-saving and labor-saving equipment

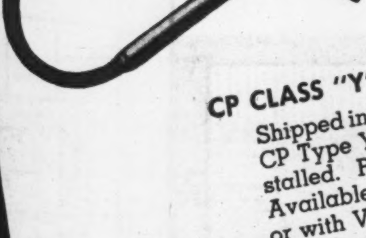
For 45 years, CP has been a familiar symbol to contractors . . . an identifying mark of efficient, dependable air compressors . . . low air consumption and low maintenance rock drills, concrete vibrators . . . clay spades . . . backfill tampers . . . time-saving wagon drills . . . equipment that doesn't have to be handled with kid gloves or babied on the job. CP knows the needs and understands the problems of the contractor and builds CP equipment to help him to greater profit.

CP 365-RP PNEUMATIC WRENCH

Speedy, powerful. CP 365-RP (Impact Type) Wrenches remove or apply nuts, bolts, lag screws, studs, in a fraction of the time required to do either job by hand. Capacity: 1¼" bolt size. There are five other CP wrenches for bolts, nuts, studs, etc., from ⅜" up to 1¾" bolt size.

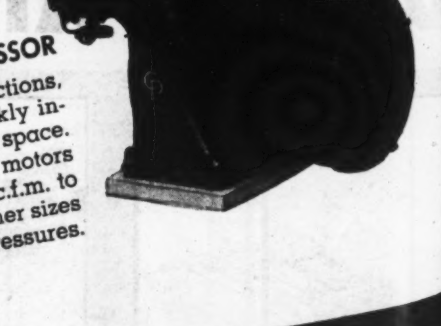
CP PORTABLE COMPRESSORS

Hundreds in world-wide use have proved the exceptional smoothness, economy and sturdiness of CP's 500-ft. Caterpillar Diesel driven, two-stage, air-cooled portable compressor. CP features include: gradual speed regulation, Simplate Valves, pressure lubrication, self-adjusting clutch, etc. Other Chicago Pneumatic Portable Compressors are available in sizes of 60 c.f.m. to 315 c.f.m., Diesel or gasoline powered.



CP-325 PNEUMATIC VIBRATOR

For reinforced concrete under 3" slump. Powerful, easily handled by one man, the CP-325 is ideal for walls and columns over 15" thick, for heavy floor and roof slabs and for appurtenances on heavy construction projects.

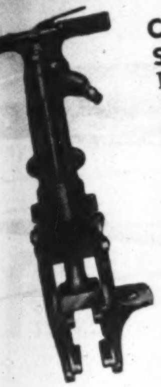


CP CLASS "Y" 'PACKAGE TYPE' COMPRESSOR

Shipped intact, all ready for external connections, CP Type Y Compressor is easily and quickly installed. Requires only minimum floor space. Available with built-in or direct-coupled motors or with V-belt drive, in capacities of 500 c.f.m. to 900 c.f.m. at 80 to 125 pounds pressure; other sizes are available for higher and lower pressures.

CONSTRUCTION
EQUIPMENT

Catalog No. 600, "CP Construction Equipment," contains essential data concerning the latest CP equipment. Write for your copy.



CP-116
SHEETING DRIVER

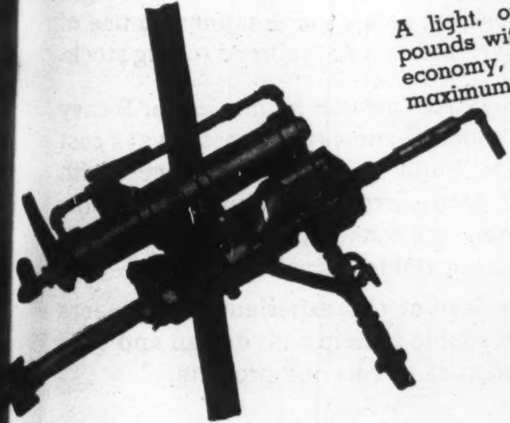
Essentially the popular CP-116 Demolition Tool with a special front head for driving sheet piling. CP Sheeting Driver has only one moving part, the piston, which strikes a fast powerful blow. Does not "broom" — sheeting can be used over and over.

CP-32 SINKER DRILL

Fast drilling speed, strong rotation and good hole cleaning makes the CP-32 ideal for shaft sinking, quarry drilling, general excavation and road work.

CP-60
MOTORDRIFTER

Recommended for drilling in hard, seamy or ravelly formations, or tunneling from Jumbo drill carriages. The CP-60's outstanding feature, the MOTORfeed, speeds up the drilling cycle, lessens operator fatigue and reduces accident risks, overall time and costs.



CP NO. 5 DIAMOND CORE DRILL

A light, one-man drill that weighs only 160 pounds without rod puller. Combines power, air economy, ease of handling, high drilling speeds, maximum core recovery and low cost per foot drilled. Drills to 500 feet depth with EX fittings. CP No. 5 works on any standard saddle, in any position from a column, arm or crossbar.

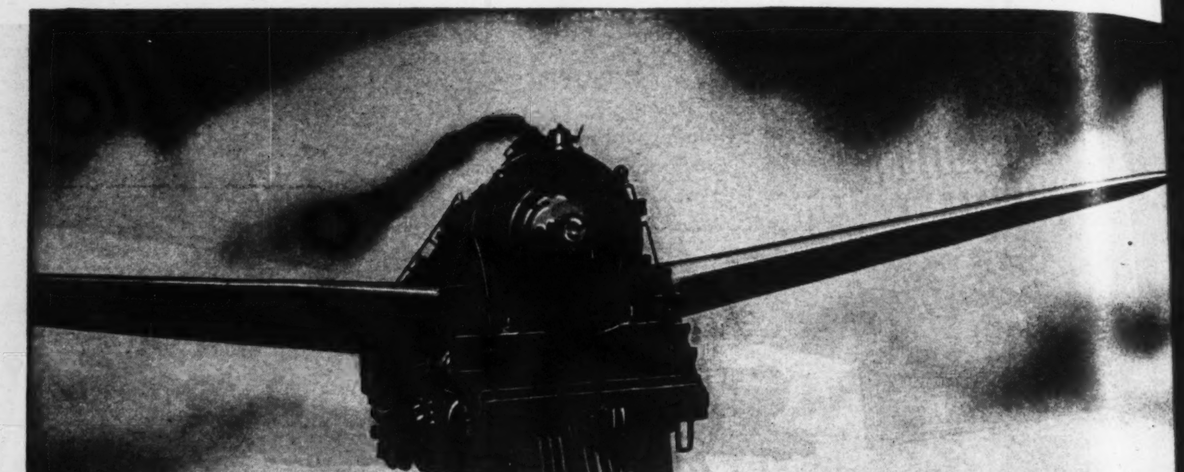
CP-117 DEMOLITION TOOL

Indispensable as a time and money-saver in tearing out dense concrete and similar medium-to-extremely hard materials. CP-117 strikes a heavier, slower blow than the CP-116, but handles with the same ease.

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL CP COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES



LOCOMOTIVES CAN'T FLY, BUT -

Engineers responsible for designing airport runways know that some modern planes—heavy bombers and transports—have wheel loads greater than the wheel loads of the heaviest steam locomotives. Runways safe for landings and take-offs with such wheel loads require pavement of unquestioned load-carrying capacity.

Looking ahead to even heavier planes, Portland Cement Association engineers have prepared design tables for wheel loads of more than 150,000 lb. These tables, giving engineering design formulas for any load, are available to all designers of airport pavement for present or postwar needs.

Speed of Construction. 20,000 square yards of concrete airport pavement has been completed in a single working day. Minimum delays for cold or bad weather.

Saving of Materials and Transportation. Concrete construction provides strength for heaviest service with minimum use of critical materials and railroad rolling stock.

Lowest First Cost and Maintenance. Heavy duty concrete runways almost always cost less to build than other surfaces with equal load-carrying capacity. Their low maintenance conserves wartime labor and materials, reduces final cost.

Services of our experienced engineers are available to help with design and construction of war paving projects.

PORTLAND CEMENT ASSOCIATION
Dept. 6E-17 33 W. Grand Ave., Chicago 10, Ill.

A national organization to improve and extend the uses of concrete
. . . through scientific research and engineering field work

BUY MORE WAR BONDS

GOOD ROADS PAY!

Since he is largely dependent on roads to market his products, the type of road over which the farmer travels can make or break him. On delivery distances of 2 to 6 miles, studies show there are double to triple the foreclosures on farms whose products are trucked on dirt roads as there are on farms whose products reach the market over surfaced roads.

Good roads pay . . . and good equipment pays! Money saved from using up-to-date machinery in road construction can be applied to building extra miles of first-class, surfaced highways. In planning your postwar construction program, figure on Allis-Chalmers' modern line of earth-moving tools . . . and you will assure your community the maximum in savings . . . the greatest number of miles of good, hard roads for your budget. Your Allis-Chalmers dealer will be glad to show you how you can profit by using the best type of equipment.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

"Probably no single factor has effected American agriculture more during the last 20 years than the combination of improved roads and the automobile. Their effect apparently has been to:

Raise the standard of living,
Increase the efficiency, and
Make farmers more responsive
to new ideas and methods.

"Improved roads are a definite part of the present economic system and rural counties and farms that do not have them available will become penalized more and more."*

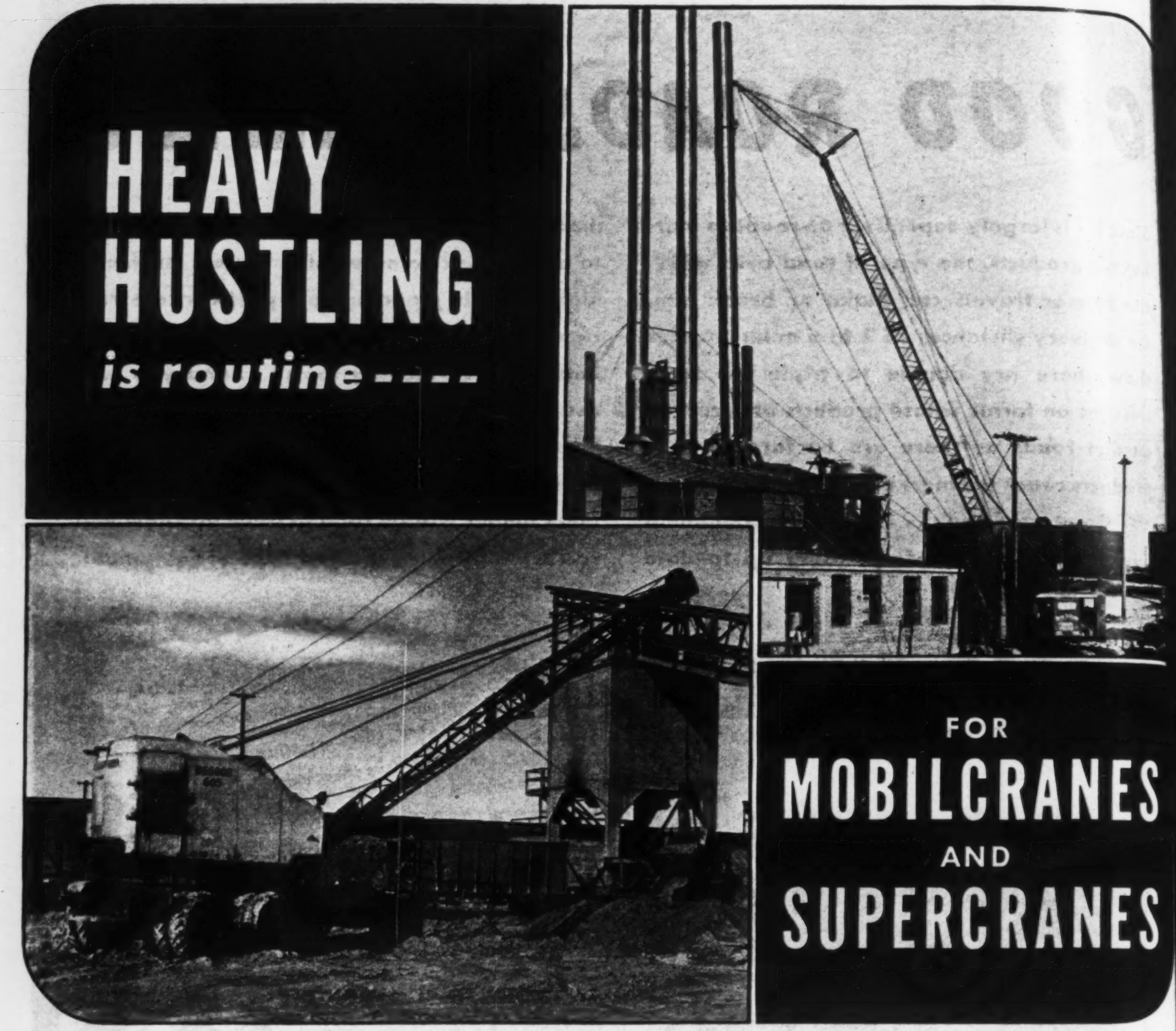
*Doane Agricultural Service, Inc.

ALLIS-CHALMERS POWER
A PUBLIC SERVICE

BUY WAR BONDS
SAVE WASTE PAPER
PLANT FOR VICTORY
TURN IN SCRAP METAL
BE A BLOOD DONOR
PAY ONLY CEILING PRICES

HEAVY HUSTLING

is routine - - - -



FOR

MOBILCRANES AND SUPERCRANES

For the heavy-duty materials handling jobs around the plant, docks, yards or warehouse, roll out a rubber-tired Mobilcrane or Supercrane.

There's the power, the mobility, the kind of easy handling qualities that the guy at the levers likes . . . and makes count.

And from an efficiency standpoint, consider this: pneumatic tires to eliminate shock and damage to road and runway surfaces; centralized one-engine power in the hands of one operator to save fuel, time and man-hours; design and construction to withstand tough punishment . . . *all at lower cost per unit of material moved.*

Remember those facts tomorrow!

ONE MAN • ONE ENGINE • RUBBER-TIRED

THE OSGOOD CO.
MARION, OHIO
MOBILCRANES

THE GENERAL EXCAVATOR CO.
MARION, OHIO
SUPERCRANES

TECO **Engineers and Timber Fabricators are ready to help you solve your building problems**

Wartime construction has proved the case for heavy timber.

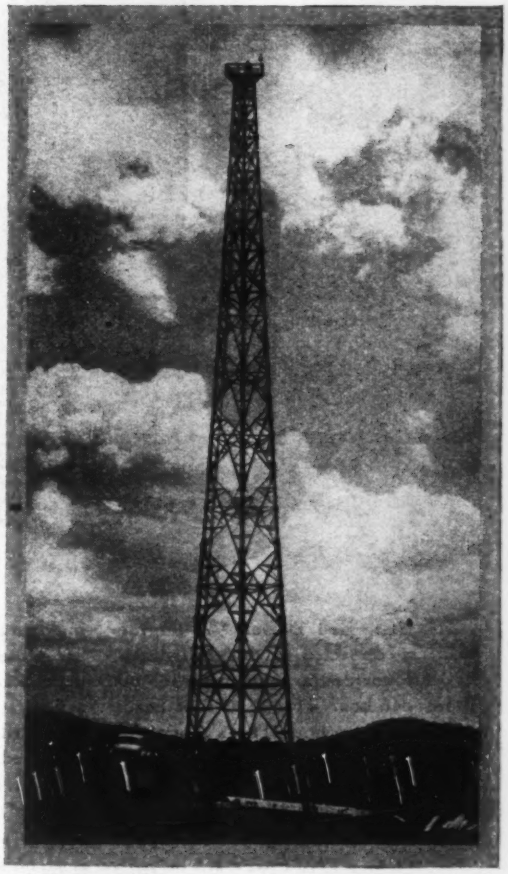
Planners of peacetime projects should study recent accomplishments in heavy-duty timber construction which would have seemed impossible a few years ago.

Many heretofore perplexing problems in design and engineering have been simplified by the TECO connector system of timber construction.

Here at TECO headquarters is a vast amount of data, typical designs, specifications, photographs, and all the "know-how" that would require years to assemble in your office.

All of this material, as well as the TECO engineers are at your service.

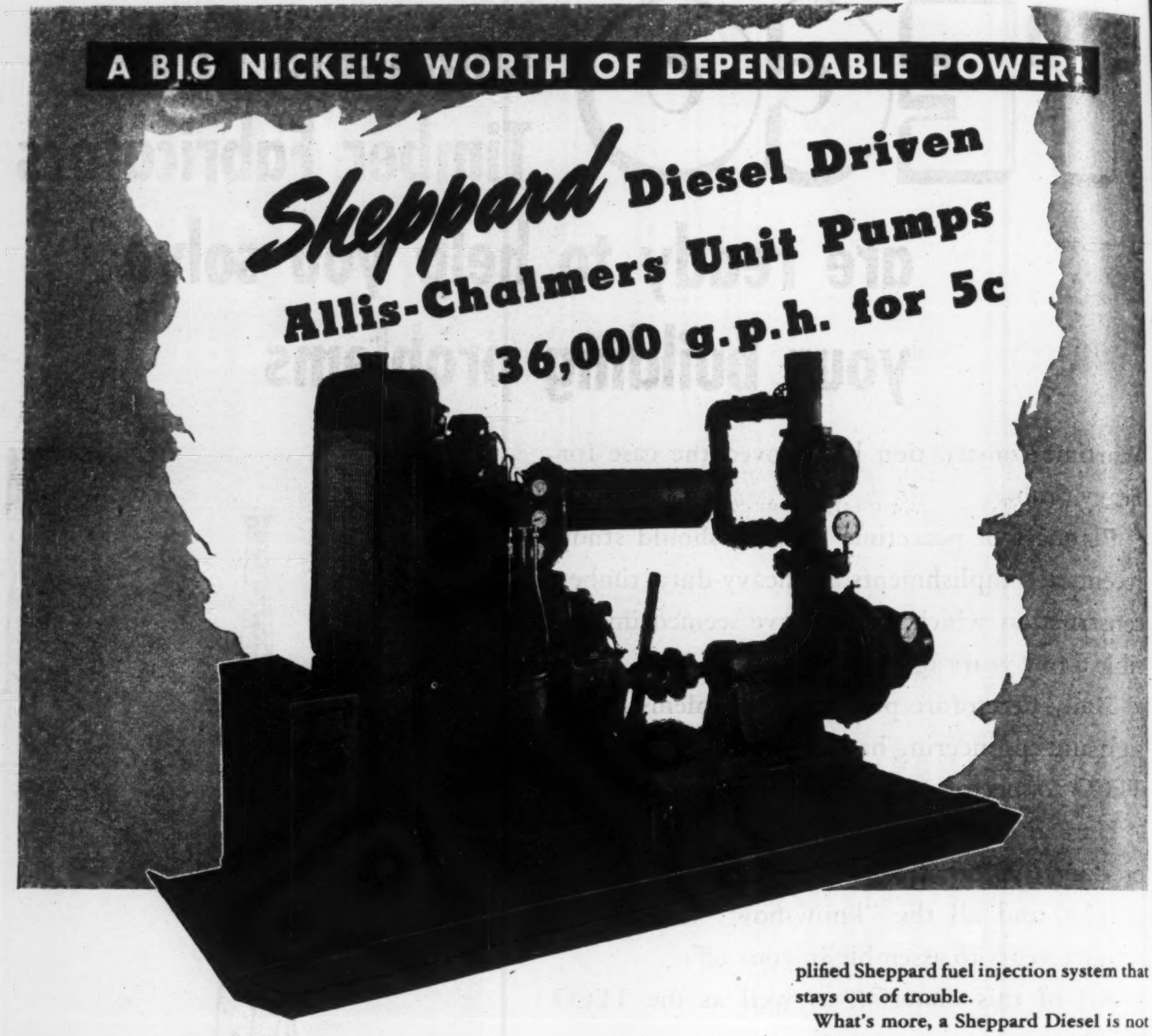
Experienced nation-wide timber fabricators with large productive capacity have produced thousands of large and small war jobs using the TECO connector system of timber construction. They continue to turn out timber structures on time. They too, can help you.



250' free standing wood tower built recently in the United States. Designed, fabricated and erected by Cartwright and Morrison, Holcomb, N. Y.

TIMBER ENGINEERING COMPANY
WASHINGTON · CHICAGO · MINNEAPOLIS · NEW ORLEANS · PORTLAND

Specify **TECO CONNECTORS AND TOOLS**
Endorsed by Leading Lumber Manufacturers and Fabricators



A BIG NICKEL'S WORTH OF DEPENDABLE POWER!

Sheppard Diesel Driven Allis-Chalmers Unit Pumps 36,000 g.p.h. for 5c

THE Sheppard Diesel 7-A Engine direct-connected to this Allis-Chalmers unit provides power to pump 36,000 gallons per hour with a 30 foot head. Fuel cost is 5c per hour. That's a lot of dependable power for a nickel!

This Sheppard Diesel reduces the cost of washing sand, coal, silt, oil field pumping operations. It is also ideal for standby fire protection. That's because complete dependability and readiness to go into action at any moment are assured by Sheppard Diesel's oil cooled pistons . . . hardened, replaceable cylinder liners . . . 4% governor regulation (closer if required) . . . and, especially, by the simplified Sheppard fuel injection system that stays out of trouble.

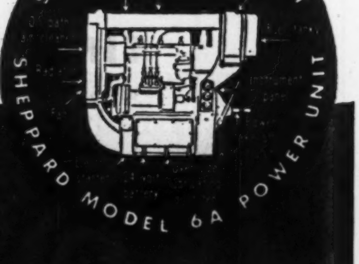
What's more, a Sheppard Diesel is not only ready to go into action at *any* moment—it's ready to go into action *the* moment you receive it. It's delivered complete. You need only add fuel and water and press the starter button.

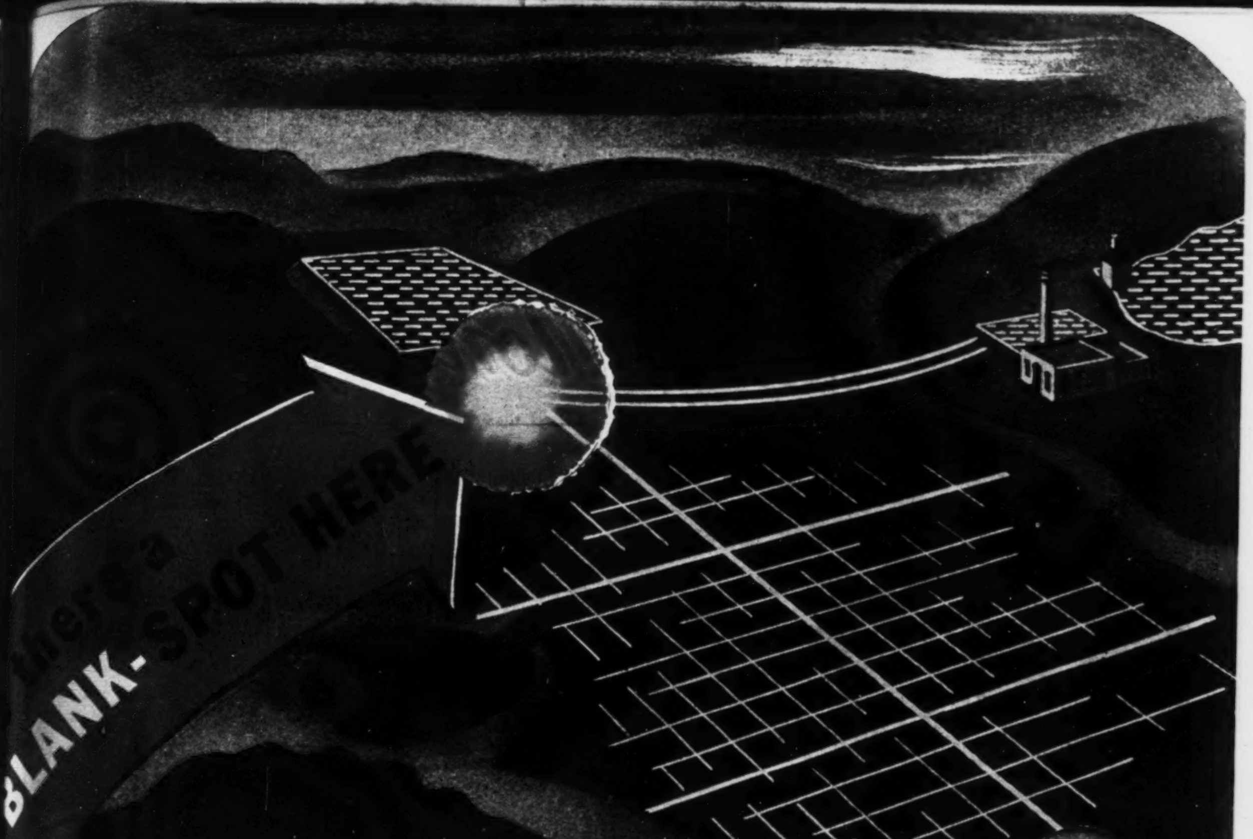
And once you press the starter button on a Sheppard Diesel, you're on the way to learning how low in cost dependable power can be!

* * *

We, too, are busy trying to help end this war as speedily as possible. But the reconversion that lies ahead is an important problem and, like other thoughtful industries, Sheppard is planning for it. Sheppard engineers are ready to help you plan your post-war Diesel requirements now. To essential industries, a few Sheppard Diesels are available on priority. Write for information and illustrated data sheet on the Sheppard Model 7-A today.

R. H. SHEPPARD COMPANY, HANOVER, PA.





in the protection you get from *Chlorination* ?

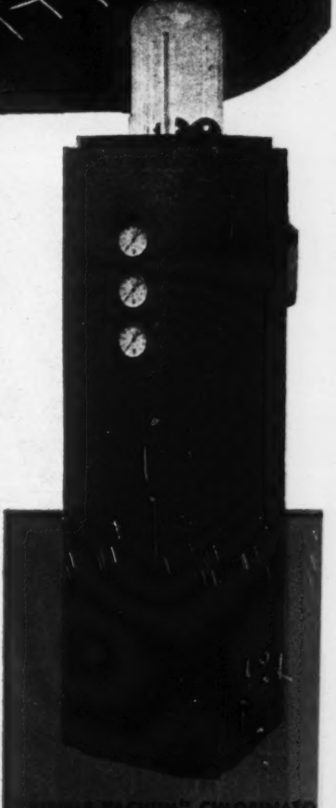
● Even though your present Chlorinator installation *produces* a safe water at the treatment plant, can you be sure that this protection is *maintained* in distribution?

Many cities are now making plans to increase their safety-insurance against recontamination at distribution reservoirs, floating reservoirs or finished water storage basins.

Secondary chlorination at the reservoir outflow helps maintain a free chlorine residual throughout the distribution mains. W&T Chlorinators of the automatic-proportioning type, have the wide operating range and protection against flow reversal that's needed for this type of service.

Why not check with W&T engineers on ways and means for eliminating this "blank-spot" in 100% protection of water supplies?

"The Only Safe Water is a Sterilized Water"



"VISIBLE VACUUM" CHLORINATO
FOR AUTOMATIC PROPORTIONING O
CHLORINE TO THE FLOW OF WAT

WALLACE & TIERNAN
COMPANY, INC.
MANUFACTURERS OF CHLORINE AND AMMONIA CONTROL APPARATUS
NEWARK 1, NEW JERSEY • REPRESENTED IN PRINCIPAL CITIES

Steel takes the Backache out of Monday

THIS is Monday in Europe. Even after the war, this age-old routine, familiar to every Continental village, must continue. Steel is too scarce and too expensive over there for most people to enjoy the household facilities that we take so much for granted.

Plentiful, low-cost steel relieves American women of drudgery--makes available to the masses the "luxuries" of running water, automatic laundry equipment, refrigerators, ranges. There is no other metal sufficiently abundant or suitable to take over this job.

For 42 years, Youngstown has helped to convert America into a nation of running water--supplying millions of miles of durable, low-cost steel pipe, fabricated by constantly improved, more efficient methods. Youngstown has also supplied steel sheets for millions of washers and tubs, ranges, refrigerators and other home equipment.

Now, war's demands for steel are being satisfied. But soon we shall resume the unfinished job of suppling you, our customers old and new, with dependable, economical pipe and sheets to further eliminate drudgery and advance the American standard of living.

QUALITY
TRADE MARK
YOUNGSTOWN
SERVICE

YOUNGSTOWN

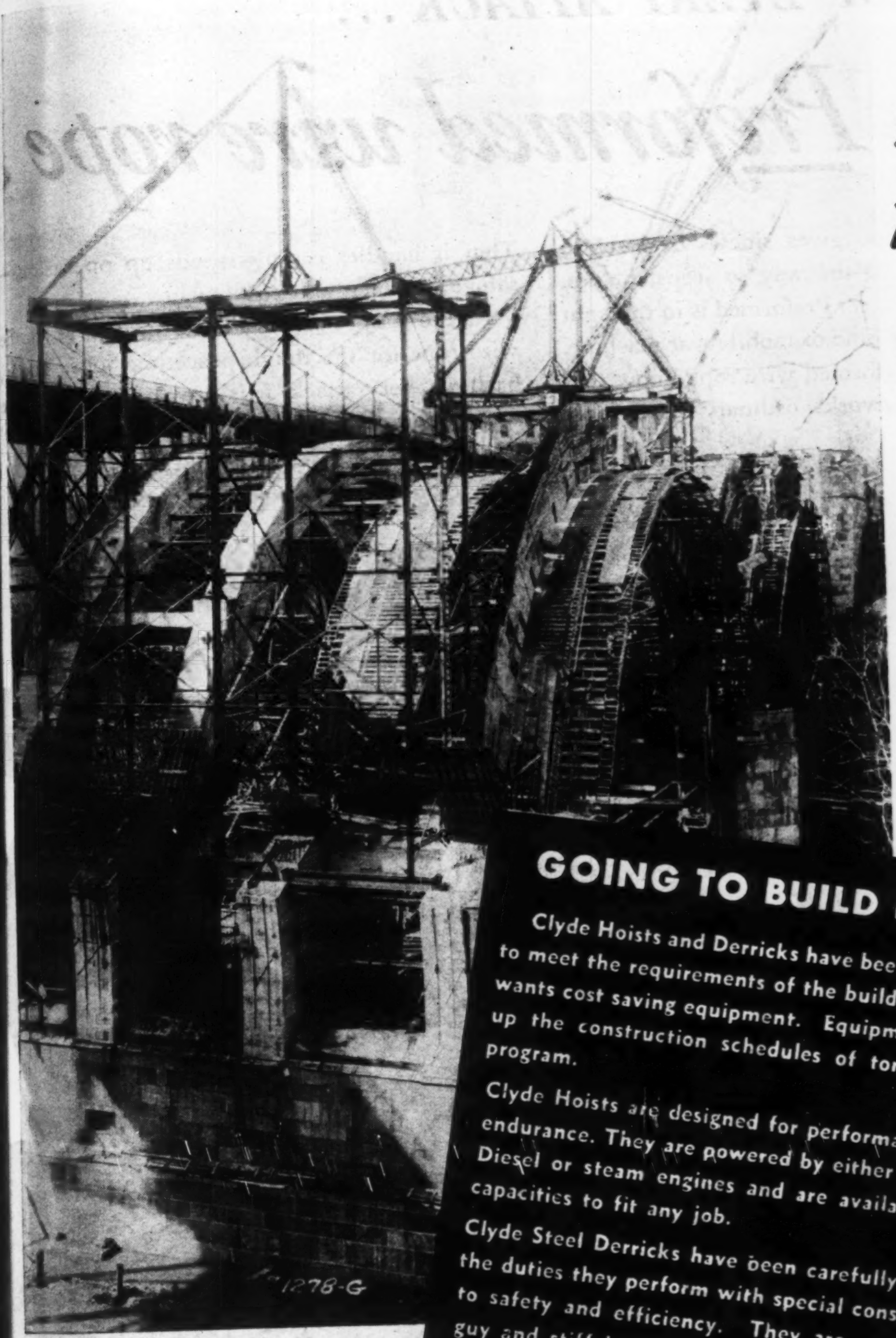
THE YOUNGSTOWN SHEET AND TUBE COMPANY

YOUNGSTOWN, OHIO

Manufacturers of

CARBON · ALLOY AND YOLOY STEELS

Pipe and Tubular Products · Sheets · Plates · Conduit · Bars · Tin Plate
Rods · Wire · Nails · Tie Plates and Spikes · Alloy and Yoloy Steels



Plan now for the job you'll do tomorrow!

GOING TO BUILD BRIDGES?

Clyde Hoists and Derricks have been specially designed to meet the requirements of the building contractor who wants cost saving equipment. Equipment that will step-up the construction schedules of tomorrow's building program.

Clyde Hoists are designed for performance and built for endurance. They are powered by either gasoline, electrc, Diesel or steam engines and are available in sizes and capacities to fit any job.

Clyde Steel Derricks have been carefully engineered for the duties they perform with special consideration given to safety and efficiency. They are available in either guy and stiff leg types in all practical sizes.

Bulletins on every type of Clyde Equipment are yours for the asking. Check their features . . . compare their quality.

CLYDE

CLYDE IRON WORKS, INC.
DULUTH, 1 MINNESOTA

BACK OF EVERY ATTACK...

Preformed wire rope

Preformed wire rope gives sinews of steel to bulldozers that clear the way so jeeps, planes, and trucks can advance. Preformed is in the fight on practically every kind of mobile war machine.

Men who use Preformed wire rope know that it outlasts and outworks ordinary wire rope. That it handles easier—speeds up operations—safeguards men and equipment.

In the past, Preformed has proved it is the wire rope for the tough peacetime jobs. Today, back of every attack, it is proving that it is the wire rope for the tough war jobs.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR SUPPLIER FOR PREFORMED WIRE ROPE

5TH WAR LOAN

Save with TIMKEN ROCK BITS

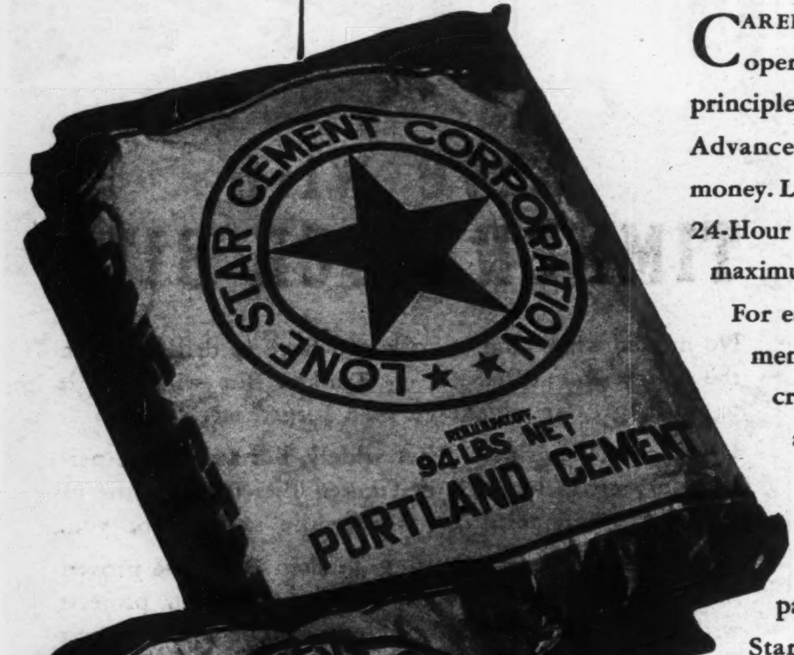
No matter what kind of rock you have to drill — from the softest to the hardest — Timken Bits will drill it to much greater advantage than forged steels.

Drilling problems may differ widely, but among the performance characteristics of Timken Bits there is one or more that will result in worthwhile savings for you.

Hundreds of contractors using Timken Bits have proved their superiority on thousands of construction projects with great satisfaction and profit. A trial on your toughest job will convince you that here is a tool you cannot afford to be without. Write for further information. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
ROCK BITS

"COMBINED OPERATIONS"



CAREFULLY planned "combined operations" win battles; the same principle whips concreting problems. Advance planning saves time and money. Lone Star Cement and 'Incor' 24-Hour Cement dovetail to produce maximum construction economies. For each job, estimate which cement produces the lowest concreting cost . . . forms, time and cement all considered. Where overnight stripping strength shows a net saving, use 'Incor'*; for other parts of the structure, use Lone Star Cement. That's selective concreting . . . and it saves time and money!

*Reg. U. S. Pat. Off.

PLAN IT

FOR QUALITY, SPEED, ECONOMY

Estimate each job with BOTH of these high-quality Cements . . . results since 1927 prove 'Incor' advantages on—

STRUCTURES — 24-hour form removal . . . 50% less forms . . . no reposting.

HEAVY-DUTY FLOORS — overnight service, greater wear-resistance.

WATERTIGHT CONCRETE — one-day curing . . . dense and durable.

WINTER WORK — saves heating, tarps, forms.

LONE STAR CEMENT CORPORATION

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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 25-MILLION BARRELS ANNUAL CAPACITY

NGINEERING NEWS-RECORD

to Buildings, Sewers, Waterworks, Bridges, Roads, Dams, Foundations, Earthwork, Flood Control, Public Works, Shipbuilding, Irrigation, Canals, Railroads
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l. 132 June 29, 1944 No. 26

OMING NEXT

Rush construction of airfields, a
jor factor of warfare in the Pacific,
greatly facilitated by develop-
means of making good runway
faces with coral. Methods of
dling coral, desirable conditions
working with it and results
hieved will be described in the
ly 13 issue. This will be the sec-
d in a series of technical articles
blished in *ENR* by N. A. Bowers,
cific Coast Editor, from data
cured during his recent 28,000-
ile tour of our Pacific bases. In
njunction with this article, Dr.
arold T. Stearns contributes a most
teresting article on the various
pes of coral found on Pacific
lands, their distinguishing traits
d qualities.

Recognizing the interest of the
gineering profession in erosion
oblems at the toe of high dams,
NR will publish in the July 13
sue, an analytical report covering
osion damage in the spillway
cket at Grand Coulee Dam as re-
ealed by recent inspections. What
being done to correct the prevail-
g conditions and future plans for
aintenance will be described in
etail.

• Realizing that the design of post-
ar highways should not be merely a
ontinuation of prewar standards,
he Arkansas State Highway Com-
mission has revamped its standards
f design for both bridges and high-
ay construction. Major changes
ffect width of roadway and right-of-
ay, subgrade stabilization and pave-
ment design, highway classification
nd alignment, bridge and shoulder
idths, limiting grades and curva-
ture. These changes will be pub-
lished in *ENR* for July 13.

LOOKING AHEAD

• How the Navy is using to exceptional advantage its steel box pontoon units in the Pacific theater of operations will be told by N. A. Bowers, *ENR* Pacific Coast Editor, in an early issue. Originally made only in the States (*ENR* April 20, p. 540), the plates are now shipped flat — knocked-down form — thereby saving 80 percent of cargo space. Seabee welding crews are completing the units in assembly depots near the front.

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CHANGE OF ADDRESS

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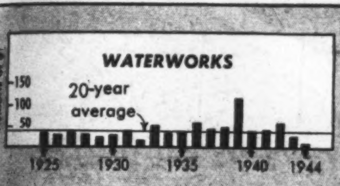
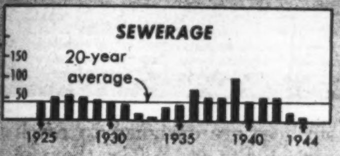
First Half Construction Down 51 Percent

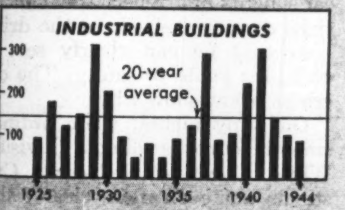
Decrease due primarily to 61 percent federal drop; private work 13 percent nder '43, but state and municipal climbs 5 percent.

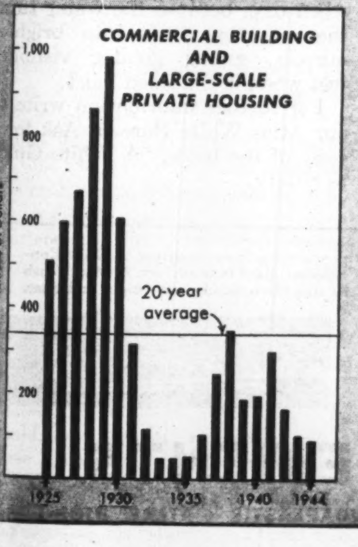
I THE FIRST half of 1944 $891,830,00 in civil engineering construction was put under way, 51 percent ss than reported to *Engineering News-Record* for the period in 1943. Private work totaled $201,481,000 for the six months, 13 percent under last year. Public work, $690,349,00, was 57 percent lower, with federal work declining 61 percent. State and municipal construction climbed 5 percent above the volume reported to ENR for the six months period last year.

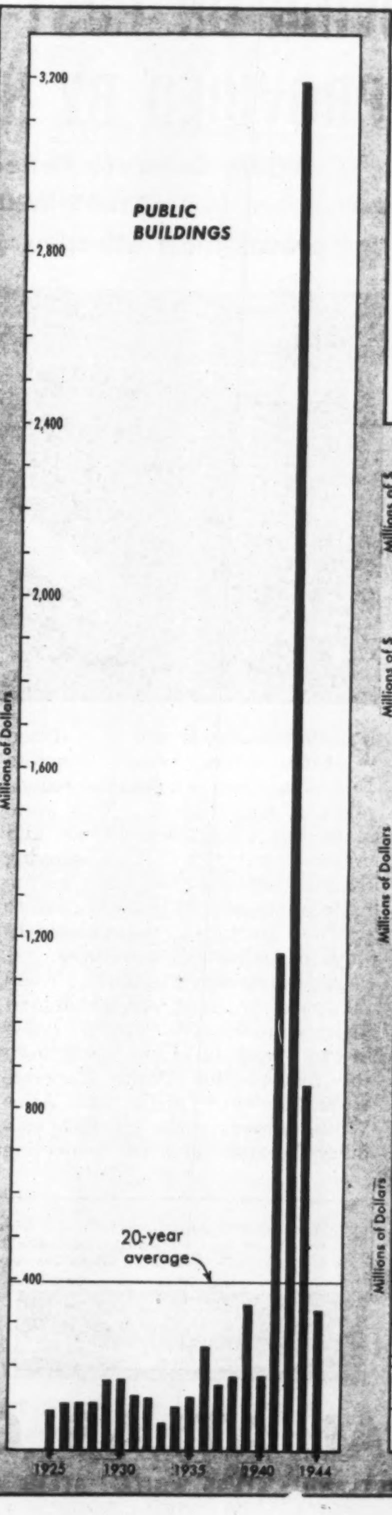
Earthwork and drainage construction rose 53 percent compared with the 1943 first-half total, and was the only class of work to gain. Losses ranged from 15 percent in commercial buildings to 62 percent in public buildings. All classes of construction were below their respective 20-year averages. Unclassified construction volume, $221,985,000, almost reached its average of $225,000,000 for the years from 1925 to date, but it declined 58 percent from the six months 1943 total.

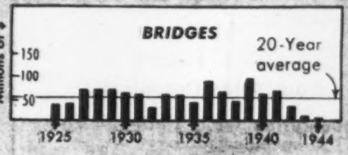


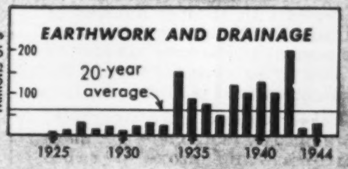


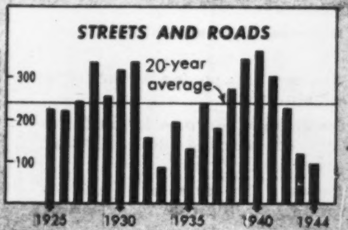


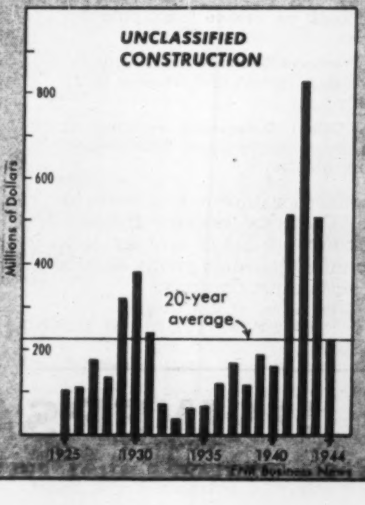












CONCRETE HIGHWAY NEWS

Universal Atlas Cement Company (United States Steel Corporation Subsidiary)
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SAFER NIGHT DRIVING ON POST-WAR HIGHWAYS PROVIDED BY NEW TYPE CURB

White Concrete Reflecting Curb made with ATLAS WHITE CEMENT proves most effective when visibility is lowest

Under car headlights alone, White Concrete Reflecting Curb is a gleaming guide, even brighter when wet with rain (as shown) than on a clear dry night.

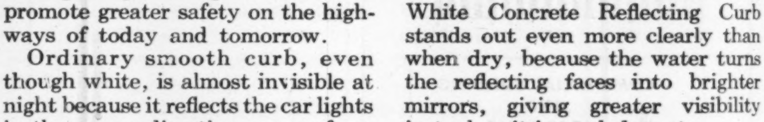
PENNSYLVANIA is one of a dozen states where White Concrete Reflecting Curb is helping to reduce night driving hazards. This state alone has 17 projects in use and under construction, each employing this new type curb which utilizes the basic principles of light reflection to promote greater safety on the highways of today and tomorrow.

Ordinary smooth curb, even though white, is almost invisible at night because it reflects the car lights in the wrong direction—away from the driver. But White Concrete Reflecting Curb made with Atlas White cement gives greatest visibility because its *white* projecting surfaces are designed to catch the car's lights and reflect them in the right direction—back to the driver—so that he can clearly see the curb, his guide to safety. The diagrams below show why.

On rainy nights, when ordinary smooth curb is almost invisible, White Concrete Reflecting Curb stands out even more clearly than when dry, because the water turns the reflecting faces into brighter mirrors, giving greater visibility just when it is needed most.

For further information write to our Atlas White Bureau. Ask for a copy of the book, "A White Guide to Safety."

A smooth curb (left) wastes light . . . reflects it up and away from the driver. A White Concrete Reflecting Curb (right) conserves light . . . reflects it back to the driver. A smooth curb is barely visible at night; a White Concrete Reflecting Curb stands out—bright and clear.



PAVEMENT SCALING SOLVED IN OVER A DOZEN STATES AND CITIES

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Over 60 paving installations during the last five years from New Hampshire to Minnesota made with Atlas Duraplastic are proving the scale resistance of this Universal Atlas development. Some have passed their fifth winter of service—and all are practically scale-free.

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2. **Provides** the proper amount of entrained air by intergrinding with the cement the precise amount of air-entraining material needed for satisfactory field performance.
3. **Makes concrete** more workable, more plastic, more cohesive, more uniform, and more durable throughout.
4. **Minimizes segregation** and bleeding.
5. **Requires less mixing** water for a given slump.
6. **Fortifies the concrete** against the effects of freezing and thawing weather.
7. **Renders the concrete** highly resistant to scaling due to action of de-icing salts.
8. **Tends to reduce** manipulation scale.
9. **Produces concrete** that dumps, spreads, screeds and finishes more easily.
10. **Called Duraplastic** because it makes concrete more durable and more plastic.

For further information write to our Technical Service Bureau. Ask for reprints of articles from technical journals giving details of actual installations.

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ENR-CD-3

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The Week In Engineering and Construction

ENGINEERING NEWS-RECORD • JUNE 29, 1944 • VOLUME 132 • NUMBER 26

WPB sets up new control over all use of lumber

Consumers are now to be classified in four categories according to the specific amount of lumber they require. Production, distribution and use controlled.

Effective Aug. 1, the War Production Board will assume over-all control of lumber. Control will cover production, distribution, and use of all sawed lumber of any species, in any grade and size. Heretofore, control has been in effect over certain species only.

Procedures are outlined in amendment to WPB Order L-335. Under the original order issued last March, large users were required to file on Form 3640 their requirements for the third and fourth quarters (*ENR*, p. 104, April 6). Requirements have now been made more specific.

The order, which classifies consumers in four categories, explains that the term 'consumer' as used in the order "does not include persons, including contractors who receive lumber for use on construction work done for other persons. The person for whom the construction work is done is the consumer."

Forms must be filed

Class I, consumers are persons who, upon filing Form 3640, have been granted authorization to receive 50,000 bd. ft. or more in one quarter; and those who expect they will need as much as 50,000 bd. ft. in a particular quarter. Persons who have received an authorization on Form-3640 must continue to apply for authorization for subsequent quarters, even though their requirements may drop below 50,000 bd.ft. All Class I consumers must file Form 3640 for authorization to purchase, and must certify all purchase orders. Supplementary applications for additional amounts may also be filed.

Class II consumers are those who would have to file application as a Class I consumer except for the fact that they require less than 50,000 bd. ft.; persons needing lumber for mining and smelting operations; and those who need it for construction jobs expressly authorized by WPB or some other federal agency which issues authorizations for construction. They need not file application for authorization to receive lumber, but they must place both certified and rated purchase orders.

Under a delegation of authority from WPB, the War Food Administration is to set up procedure by which farmers may obtain lumber.

Under the last category, consumers who have no ratings or only an AA-5 MRO rating, place uncertified orders only. The amount of lumber they get will depend on the amount permitted under a directive to be issued by WPB.

Quabbin water offered 15 Greater Boston towns

Fifteen Greater Boston communities are being asked to link their water systems with the supply lines of the Metropolitan District Commission's water division in an attempt to extend the metropolitan water district from its present 10-mile radius to one of 15 miles. Water district officials claim there is more than a sufficient supply of water available through the Quabbin reservoir and aqueducts.

Under the compulsory water law passed by the Massachusetts legislature in 1943, cities and towns within a 15-mile radius of Boston must satisfy the state public health department that their own water systems can supply a safe yield of 10 percent over the average daily consumption for the previous three years. Otherwise they are compelled to link their water system with the metropolitan system.

Communities have not previously tied in with the M.W.D. supply because of the initial cost of joining with the system.

U. S. Army photo.

Gen. Worsham wins Legion of Merit award

Lieut. Gen. Brehon Somervell, commanding general, Army Service Forces, pins the Legion of Merit on Brig. Gen. Ludson D. Worsham, while Maj. Gen. Thomas M. Robins, deputy chief of engineers (left) Maj. Gen. Eugene Reynolds Reybold, chief of engineers (right) look on. Gen. Worsham received the award for his outstanding services as division engineer, Great Lake Division, Chicago, from May 1942 to April 1943. At present he is assistant chief of engineers in charge of troops, with headquarters in Washington.

Enactment of one comprehensive bill for postwar roads is now urged

House Roads Committee says Congress should enact without delay a single bill embodying six main points; advocates continuance of competitive bidding system

The House Committee on Roads, in its report recommending passage of a $1,500,000,000 postwar federal aid highway bill, said that during hearings on the proposed legislation, the 110 witnesses who appeared were in substantial agreement on six fundamental points which have been covered in the bill it recently reported out, H.R. 4915 (*ENR*, p. 847, June 8). These points are:

1. It is necessary for Congress to act without delay, since legislatures in 45 states will convene in 1945, and will want to know what the federal policy is as to federal aid, and the amount of funds available to states.
2. An urgent need exists for an afterwar program to overcome deficiencies, catch up on deferred construction, and otherwise to meet anticipated transportation requirements.
3. In recognition of the sovereignty of states, the federal program shall "preserve intact the principle of federal aid which has characterized road legislation for nearly three decades, allocating funds among the states by formula, matched by state funds, and administered by the Public Roads Administration in a coordinate relationship with the states."
4. Continuance of competitive bid contracts on construction and major reconstruction projects.
5. Projects approved for federal aid shall conform to a definite classification of road systems so that improvements, in order to meet transportation needs, will be made on a selective basis.
6. Congress should enact all necessary postwar highway legislation in a single, comprehensive bill.

In addition to listing these points, the report makes comment on numerous phases of the bill. Concerning federal aid in urban areas, it says: "For the first time, federal aid for improvements on the federal-aid highway systems in urban areas is given specific recognition by setting aside funds solely for that work." Bypasses of cities, alone, it continues, will not cure bottleneck congestion because "the great bulk of travel is destined for sections well inside the cities."

During hearings, several eastern states pleaded for flexibility in use of funds. In this connection, the report says sufficient flexibility has been provided to permit each state to utilize its share of funds to meet its own greatest need. Funds for the federal aid system, it points out, can be used either inside or outside of municipalities. Secondary roads can be located either in rural areas or inside cities of less than 10,000 population. And projects in urban areas may be so located as to provide for bypasses around, and routes into and through, metropolitan areas.

Concerning the proposed 40,000-mile National System of Interstate Highways, the report declares that "when improved during future years to new high standards of design," the system is expected to carry one-fifth of the total traffic, though it would represent only about one-hundredth of the road mileage of the nation.

• • •

Davison first Engineer general to die overseas

The death of Brig. Gen. Donald A. Davison in India on May 6, 1944, while enroute to the U. S. from his station in the Mediterranean Theater (noted briefly in *ENR*, May 18, p. 720) marks the first loss of an Engineer Corps general officer while on active service overseas in this war. Moreover, few top officers have equalled General Davison's accomplishments since our first D-Day in North Africa or have had better prospects for contributing further to our military successes, so that his place will be difficult to fill. Had he lived to return home it is probable that his next assignment would have been one of high prominence in the Aviation Engineers, the branch in which he was serving.

U. S. Army photo.

Brig. Gen. Donald A. Davison

General Davison, who had been graduated from West Point in 1915 and had spent most of the next 20 years on engineer military duty as contrasted with public works assignments, began his World War II activity as a pioneer in the newly formed engineer branch of of the Army Air Forces. He commanded the first aviation engineer unit—the 21st Engineers (Avn)—which was formed in 1939. He was the first Engineer of the GHQ Air Force, and was the originator and first commanding general of an engineer command. (Readers will recall the recent accounts of one of these commands, that of the Ninth Air Force, and its building of airfields for the invasion forces in Normandy). In May, 1941, General Davison went to London as engineer officer of a special army observer group, and as such was largely responsible for establishing our Army Engineer set up there and in Iceland. Finally in February 1942 he was permanently assigned to London, where he became chief of staff, S.O.S. European Theater of Operations.

All of these assignments, however, were preliminary to the real job that unfolded for General Davison after our North African invasion. Serving throughout the critical months of that campaign, he built airfields with such speed and efficiency as to earn the healthy respect of the Air Corps and establish the Aviation Engineers as a vital new branch of the Army. After the successful end of the North African campaign, General Davison continued with his airdrome construction in Sicily, Sardinia and Italy in the same tradition as had been established in the campaign in Africa.

The chronology of General Davison's active war service was as follows—November, 1942, chief of staff, headquarters, Army Air Forces in the North African Theater; then Engineer, Allied Air Forces; next, March 1943, Air Engineer, 12th Air Force (Advanced); November 1943, additional duty as Engineer, 15th Air Force; and finally, February 1944, commanding general, Army Air Forces Engineer Command, Mediterranean Theater of Operations.

During the course of his career, General Davison served four years (1928-32), as assistant to the Engineer Commissioner for the District of Columbia, and two years (1937-39) as district engineer at Louisville, Ky.

Chicago awards filter contract for new South District water plant

WPB and WMC approval ends delay in awaiting $497,000 contract. Plentiful supply of skilled craftsmen available in local area.

Construction of Chicago's South Dis-ict filtration plant moved a step nearer mpletion with the recent awarding a contract covering the installation the underdrain system, washwater oughs, gravel and sand for the 80 pid-sand filters.

Bids were received from eight con-acting companies sometime ago, but arding of the contract was delayed til WPB approval could be obtained certain critical items involved in the ork, according to Oscar E. Hewitt, mmissioner of public works.

Robert Gordon, Inc., Chicago, was arded the contract on his low bid of 97,000. Other low bidders included eo. D. Hardin, Chicago, $498,885 and he Pitt Construction Co., Pittsburgh, Pa., $499,682. All bids were on a lump-um basis.

The underdrain system will include ome 100,000 lin. ft. of 4-in. perforated astiron pipe with special 6 x 4-in. tees, nd connections, supported in rein-forced concrete slabs. Washwater roughs are to be reinforced concrete, ast in place using steel forms.

Graded filter gravel ranging in size from $\frac{1}{12}$ in. to 2½ in. will be placed to a depth of 21½ in. around and over the castiron drains. Plans call for it to be placed in 6 separate layers varying in thickness from 6 in. for the bottom layer to 2½ in. for the top.

A 24½-in. bed of graded sand will be placed on top of the gravel. Specifications call for a sand having an effective size between 0.620 and 0.700 mm. based upon the Hazen method of designating sand size.

In addition to the castiron underdrain system, bids were received on alternate types of both the Wheeler and Wagner underdrain systems. However, the bids received on the castiron system ran the lowest.

Applications for priorities to complete the filter and administration buildings of the new filtration plant were filed with the War Production Board some time ago. Based on current prices, the materials were estimated to cost $882,000; the labor, $848,000 for about 445,300 man-hours.

These man-hours will be distributed, as required, among bricklayers, carpenters, cement finishers, electricians, elevator constructors, iron workers, lathers, marble setters, painters, plasterers, plumbers, and several others. That sufficient labor, of the kind required for this construction, is available in Chicago at present, has been reported to the WPB.

Of the total work on this contract, bricklayers and their helpers will receive many more hours than other crafts. They will consume about 100,000 man-hours, with iron workers ranking next in the amount of hours.

The most recent contract on the filtration plant submitted to the WPB was for filter underdrains and wash water troughs. The city's application for approval of this contract was referred by the WPB to the War Manpower Commission. At first glance, they reported the labor situation in Chicago was so critical that they withheld their approval. In reply, the city submitted the representation of the Building Trades Council of Chicago, which indicated there was ample skilled labor for this particular contract. Then, the War Manpower Commission approved.

Unified control sought for D. C. water supply

Centralized control of the water supply and distribution system of the District of Columbia and making it a regulated public utility is recommended in the recent report of the McCarran subcommittee of the Senate District Committee.

Control of the two major divisions of the water system now is split between the Army Engineers Corps, which supervises the supply branch, and the District water department, under the commissioners, which has control of the distribution system, billing and revenue collections.

Under the McCarran plan, control over the whole system would be placed with a quasi-municipal corporation, to be created by act of Congress, which would consist of a federally employed lawyer, to be designated by the President; the engineer-commissioner of the District, to represent the city government, and a bona fide resident of the District, to be appointed by the commissioners, to represent the public.

• • •

A.S.C.E. postwar group continues housing study

A second conference of representatives of government and private housing agencies convened in Washington, June 22, to act on a report to the Committee on Postwar Construction of the American Society of Civil Engineers prepared by a subcommittee on forecasting postwar housing construction. The subcommittee was named at a conference held June 8 (*ENR* June 15, vol. p. 860.)

The submittee, made up of F. Stuart Fitzpatrick, U. S. Chamber of Commerce; Robinson Newcomb, War Production Board; and Samuel J. Dennis, National Housing Agency, recommended that statistical forecasting procedure based on consideration of economic factors be used since this would be more accurate than partial data from field surveys of home owners' and home builders' intentions. Time needed for preparing plans, the committee said, is so short in this field that owners' planning activities could not be measured far in advance of actual construction. The subcommittee also recommended use of collected field reports both east and west of the Rocky Mountains for checking purposes, together with another housing study by the Bureau of Census within the next few months.

These recommendations were approved by the conference and are to be presented for discussion in a forum on postwar construction July 19, when the society meets in Cleveland.

• • •

Sewage works proposed for City of Los Angeles

A $21,000,000 sewage treatment works to replace Los Angeles' antiquated Hyperion screening plant, said to be responsible for polluting beaches and periling health throughout the area for several years, has been proposed by the Boston engineering firm of Metcalf & Eddy, engaged by the Los Angeles City Council to study possibilities.

The projected plant would provide high degree treatment by means of the activated sludge process. The effluent would be discharged a mile off the shore of Santa Monica Bay. The plant would be built in sand hills behind the over-taxed screening works, and landscaped to give the appearance of a park.

Harrison P. Eddy and E. Sherman Chase who represented Metcalf & Eddy in the study, further recommended that an additional site for construction of a similar plant be acquired in the city's industrial area to meet the needs of growing population about 1960. The original plant would care for a population of 3,000,000.

News of the engineering schools

Dr. John B. Wilbur, professor of structural engineering at the Massachusetts Institute of Technology, has been appointed acting head of the department of civil and sanitary engineering succeeding the late Prof. T. B. Parker, He was born in Oakland, Me., and was graduated from M.I.T. in 1926, from which he received an M.S. in 1928 and a doctorate in 1933. From 1926 to 1928 he was an assistant at the institute and in the latter year joined the engineering staff of the Maine Central Railroad; from 1929 to 1930 he was a bridge designer for the New York Central Railroad in New York. He returned to M.I.T. in 1930 as a civil engineering instructor, becoming an assistant professor in 1934, an associate professor in 1937, and professor of structural engineering last year.

In the consulting field Dr. Wilbur was associated with Fay, Spofford & Thorndike, Boston, in the design of the Lake Champlain bridge and of the continuous truss highway bridges over the Cape Cod Canal at Bourne and Sagamore. He has been consulted by various engineering and insurance companies. Since 1940 he has also been chief engineer for the Smith-Putnam wind turbine project near Rutland, Vt., for the S. Morgan Smith Co. He was responsible for the development of the structural analysis laboratory at M.I.T. and developed and built a simultaneous calculator which solves nine linear simultaneous equations.

Dr. Wilbur is the holder of the Desmond Fitzgerald medal given by the Boston Society of Civil Engineers, and is the author, with W. M. Fife, of a text book, "Theory of Statically Indeterminate Structure", and of many technical papers.

Revised freshman admission dates for the California Institute of Technology, permitting entrance of new students at the beginning of each semester, have been announced. Since the California Institute is now operating on an accelerated instruction program of three semesters a year, this revision means that freshmen will be admitted every July 1, Nov. 1 and March 1.

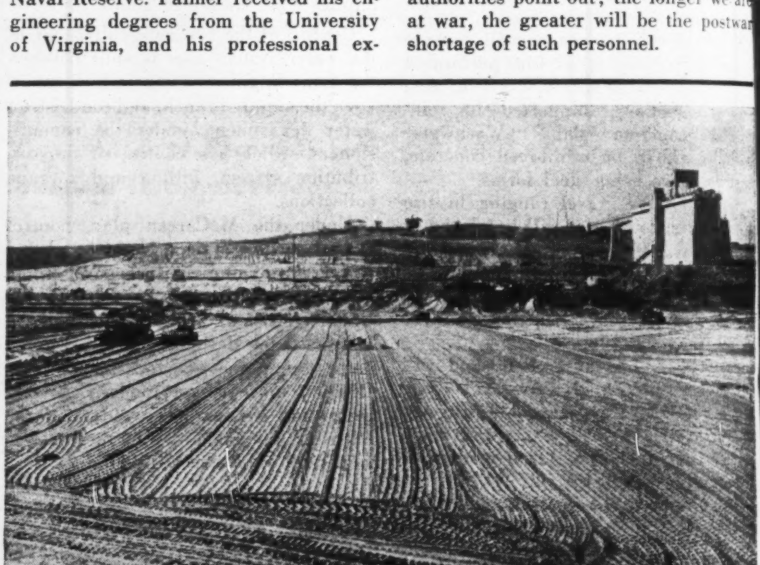
Robert E. Stiemke, of Raleigh, N. C., director of the North Carolina State College engineering experiment station, has been commissioned a first lieutenant in the Army and has been assigned to the United States Public Health Service as a sanitary engineer. Stiemke was a former member of the faculty of Wayne University, Detroit, and went to N. C. State College in 1942 as professor of sanitary engineering. He later was made director of the engineering experiment station.

Lieutenant Stiemke's successor at N. C. State has not been named.

Aubrey E. Palmer, former member of the engineering faculty at the University of Mississippi, has become instructor in civil engineering in the Duke University School of Engineering, Durham, N. C., replacing R. Kenneth Jacobs, assistant professor, who resigned recently to accept a commission as a lieutenant (jg) in the United States Naval Reserve. Palmer received his engineering degrees from the University of Virginia, and his professional experience includes two years as an en neer of the Blue Ridge Parkway d velopment in North Carolina and Vi ginia, and seven years as a structur engineer on flood-control projects a industrial plant developments in We Virginia and Virginia.

Postwar tecnical and engineering jo will be more plentiful than adequatel trained men to fill them, say colleg placement officials participating in survey by Northwestern National Li Insurance Co. Trainees of Army an Navy "condensed" technical course may be in oversupply, some placemen officials feel, and will need furthe training in order to compete with regu lar engineering graduates. A number o colleges are already planning postwa courses that will round out the profes sional schooling that such trainees hav received.

Removal of draft deferments from en gineering students almost completel shuts off the new supply of graduat engineers and technicians, placemen authorities point out; the longer we ar at war, the greater will be the postwa shortage of such personnel.



World's largest rolled fill dam dedicated

Completed by the Army Engineers as a war emergency measure to control floods on the Red and Washita Rivers, the $54,000,000 Denison Dam and reservoir is scheduled for completion and dedication on July 1.

More than 17,000,000 cu.yd. of earth has gone into the 14,000 ft. long main embankment to make it 165 ft. high above the river bed and the world's largest rolled-fill structure. Maximum base width is 1150 ft.; the earth fill rises 20 ft. higher than the intake structure shown in the picture.

Reservoir capacity is 5,825,000 ac.ft. of which 1,000,000 ac.ft. is for silt storage, 2,060,000 for power storage and the rest for emergency storage to prevent floods in Oklahoma, Texas, Arkansas and Louisiana.

Excavation for the spillway and construction of the main embankment was done by the Guy F. Atkinson Co. Spillway, intake and powerhouse were built by C. F. Lytle Co. The Army Engineers will operate the dam and power will be sold to the Southwest Power Administration.

Construction Communiques

Engineering news from the battlefronts

Normandy Beachheads—The assault engineers were in the van of the Allied invasion of France. The combined Allied press dispatches of June 7 said that "to them came the job of moving into the beach long in advance of zero hour so as to remove the underwater mines, clear a path for the assault craft and sweep the beach strips free of mines." All this had to be done while in constant danger of attack from the German defenders.

Also, during the first four hours of the invasion, units of the 9th Engineering Command—composed of aviation engineers trained both for combat and construction—were reported to have moved in under command of Brig. Gen. James B. Newman, Jr., who has been in the Engineers Corps for 26 years. (*ENR*, June 15, p. 860). The function of this new organization, a component of the 9th Army Air Force, is to construct advanced airfields on the continent.

Italy—Fifth Army combat engineers, on account of the nature of their work at the time, were the first to greet the advance Anzio beachhead units when the historic junction was made on May 25, according to a dispatch in the New York *Times.* The engineers were following the retreating Germans to rebuild bridges shortly after these were blown up by the Nazi demolition squads. In repairing the last culvert the platoon had the help of many Italians, so their work was quickly done and the engineers went on and were twenty minutes ahead of the reconnaissance group at the meeting place, much to the chagrin and disappointment of the latter.

The Gilberts—Writing in the Memphis Tenn. "Commercial Appeal," Walter Durham tells an interesting story about Joe Searcy of the Seabees.

"Before Pearl Harbor," says Mr. Durham, "Joe Searcy was a big, blunt, hard-fisted construction engineer who built hundreds of miles of highways in the South and West. He was proud of the smooth ribbons of concrete he'd unrolled across Mississippi, Louisiana, Oklahoma, Texas and California.

"But as Chief Petty Officer Joe Searcy of the Seabees, he's prouder still. That's because he recently completed the most important building job of his 25-year career, and in doing it he demonstrated American genius for construction and for overcoming such obstacles as time and the elements.

"Searcy was construction foreman of the outfit which built the Edward H. (Butch) O'Hare Airport on the Island of Abemama in the Gilberts in just eight days after the first cocoanut palm was nosed over by a bulldozer.

"Chief Searcy and other men of his Seabee battalion, together with a group of Marines, moved in on Abemama just six days after the battle of Tarawa had gained for the United States another operating base in the South Pacific. While the Marines busied themselves with the defense of the outpost, the Seabees went quickly to work. They did their job so efficiently that planes were landing 192 hours later on a coral strip that a week before had been dense jungle.

"The Japs caused us some delay," Searcy admitted, "otherwise we would have finished a day or two sooner. You see, we didn't have any protection against enemy bombings until the field was completed."

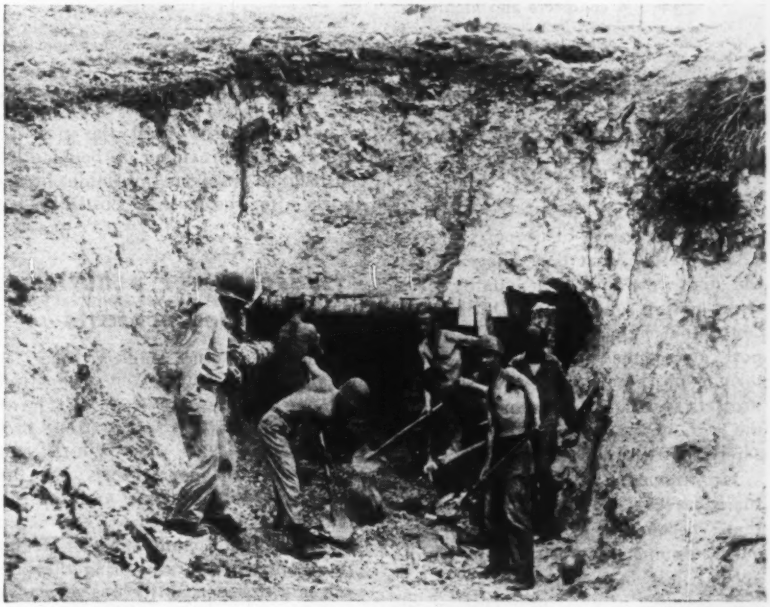
Solomons—The Navy Department issues this interesting account of the establishment of a fresh water supply for our forces on an island in the Solomons group in the South Pacific.

"It was the end of one of the many rainy seasons when the 33rd Construction Battalion landed. Natural drinking water resources were running low. With all types of landing craft and many cargo vessels making port there, the demand for drinking water was great.

Under Lieutenant Walter Suydam, Civil Engineer Corps, U.S.N.R., the Seabees drilled to a depth of 65 ft. before finding water. It was necessary to drill another 20 ft. to insure an adequate supply. Converted pitcher pumps were used at the bottom of the well, but proved impractical. Finally the late Harland O. Clawson, ship fitter, first class, U.S.N.R., of Little Rock, Ark., designed and helped manufacture a satisfactory pump in the makeship blacksmith shop. It was actuated by a tractor found on the island. Later two more wells were dug and two-cylinder engines were used to actuate all three pumps.

The normal output of each well is between 1,800 and 2,000 gph., although they have pumped 3,400 gph. on test. All water is aerated and chlorinated. Four storage tanks, made from native lumber, hold 38,000 gallons.

At the dock, four craft can take on water simultaneously. Gravity furnishes the needed pressure and 30,000 gal. can be discharged in one hour.



U. S. Navy photo

Seabees clean out a former Jap office on Munda

The tunnel pictured above was once an office from which the Japanese directed their activities at Munda airdrome, New Georgia Island. The tunnel had survived many direct hits by our 1000-lb. bombs.

Immediately after U. S. forces occupied Munda the Seabees cleared out the tunnel and it was re-opened "under new management," as is the case with many other Jap installations in the South Pacific.

JOBS OF THE WEEK

POST OFFICE, Long Island City, N. Y.

U. S. Engineers, New York, N. Y., received the lowest bid from John A. Johnson & Sons, Brooklyn, N. Y., for constructing superstructure of postal concentration center at $2,335,916. Alfred Hopkins & Associates, New York, N. Y., are the architects.

AIRPORT, Springfield, Mo.

Civil Aeronautics Administration, Kansas City, Mo., awarded a contract for Schedules 1 and 2 for airport to Gustafson & Jarvis Construction Co., Sioux Falls, S. D., at $776,592. Schedule 4 was let to Koss Construction Co., Des Moines, Ia., $666,474. B. F. King, Kansas City, Mo. is the engineer.

AIRPORT, Dubuque, Ia.

Civil Aeronautics Administration, Kansas City, Mo., awarded the contract for constructing an airport to McVaugh-Haynes Co., Peoria, Ill., at $1,581,806. B. F. King, Kansas City, Mo. is the engineer.

NATURAL GAS PIPE LINE, Pennsylvania

Peoples Natural Gas Co., Pittsburgh, Pa., and Hope Natural Gas Co., Clarksburg, W. Va., awarded a contract for 145 mi. of natural gas pipeline between Greene County, Pa., and Wetzel County, W. Va., to Monongahela & Ohio Dredging Co., Pittsburgh, Pa.; to B & M Construction Co., Oklahoma City, Okla., and Pipe Line Construction Co., Harrisburg, Pa. The estimated cost is $2,700,000. R. J. Plank, Pittsburgh, Pa. is the engineer.

POSTAL CONCENTRATION CENTER, Oakland, Calif.

The U. S. Engineers, San Francisco, Calif., will construct a postal concentration center at the Oakland Army Base to cost $1,025,000. Ford J. Twaits Co., San Francisco, has been awarded the construction contract.

HOUSING, Baltimore, Md.

The Public Housing Administration, Washington, D. C., awarded a contract for constructing the Cherry Hill Housing project to Ross Engineering Co., Washington, D. C., at $3,335,000. Whitman, Edwards & White, Baltimore, Md., are the engineers and architects.

Note—Additional bidding and contract news on many projects large and small appear in the Construction News section beginning on page 145.

Street work moratorium proposed in Seattle

Engaged by the Seattle city council to review testimony of property owners who protested what they alleged to be the high cost and poor quality of a street paving job, William D. Shannon, consulting engineer, included in his report a recommendation for a moratorium on new street and sidewalk projects in residential areas until after the war, unless required by health or safety hazards.

Mr. Shannon gave the project virtually a clean bill of health, but urged that, "because of the difficulty of procuring competent craftsmen to handle special jobs on a contract of this kind, and because of the high cost of all such work done in these times of economic stress, that no further contracts, except those necessary for the health and safety of the public, be authorized until the postwar period; and if petitions are presented to the city council, that they be considered, but calls for bids deferred until the postwar period; thus providing a backlog of construction projects available immediately after the close of hostilities."

• • •

Hudson River pollution stirs strong protests

Pollution of the Hudson River at Indian Point, N. Y., by industrial drainage and sewage from two large war factories carried recent strong protests to the state and Westchester County health departments by the Hudson River Day Line and the village of Buchanan.

Deputy State Commissioner of Health Paul B. Brooks, in answering the protests said that the matter was primarily a county responsibility, but the county health department contended that the state need only prove the pollution a nuisance to order it abated, while the county would have to prove it a health menace. The result is a temporary stalemate, with the pollution, which all parties agree is a nuisance, continuing.

Scenic highway planned along Mississippi River

The building of a scenic highwa along the entire length of the Mississippi River is proposed as a postwa project and plans have gone so far tha legislation for the "Mississippi Rive Parkway" is pending in Congress. Th bill, HR4985, now before the Committe on Public Lands, is the outcome of study authorized eight years ago b Congress and the legislatures of the te states bordering the river.

Since the proposed parkway—from the Itasca State Park in Minnesota t the Gulf of Mexico—would be fo recreational rather than commercia traffic, it would be planned, constructed and maintained by the National Park Service and the Public Roads Administration at federal expense. It is proposed that rights-of-way or easement on private property be obtained by th various states. The bill also authorize establishment of the route across property held by United States agencies.

The parkway area would include a average of 100 acres per mile and easements of another 50 acres per mile over the length of the route in each state. The minimum width would b 200 ft. While in general it would follow the course of the river, the roadway would go around or across river bends.

• • •

Waco, Tex., rations water because of flood damage

Citizens of Waco, Tex., are voluntarily submitting to water rationing as a result of the recent flood from the Brazos and Bosque rivers which broke the main water line from Lake Waco. Several landslides carried out about 600 ft. of the 37½-in. cast-iron pipe of the main water line. All foundations on which the line could be rebuilt was washed away and the break was in an almost inaccessible location where a road had to be built down a mountainside before heavy equipment could be brought to repair the trouble.

Low lift pumps are being used to pump water from the Brazos River, but as their capacity is only between 6 and 7 m.g.d. and the normal water consumption of the city is between 8 and 9 m.g.d., rationing has become necessary.

All consumers are being asked to curtail their use of water to the absolute minimum. Service stations are requested to stop washing cars; citizens to stop watering lawns and gardens; swimming pools have been closed; and industrial and commercial users are cutting their use of water to the minimum.

OBITUARY

Thomas P. Brown, 68, who has been civil engineer for Wayne County and e City of Wooster, Ohio, died June 14.

Charles O. Matthews, 53, of the U. S. gineers died in Washington, D. C., ne 15. He was a veteran of the 42d, ainbow," Division in the first World ar.

Frederick Holmes Yancey, 55, an as- tant construction engineer with the ntucky state highway department for years, died at Frankfort, Ky., June

Robert Hall Craig, 51, consulting en- eer of Harrisburg, Pa., died June 18 Philadelphia. He was vice-president the Flood Control Council for the squehanna drainage area, owned in- ests in several water companies, held icial positions with additional com- nies and served as consultant with merous water companies in other tes.

George W. Diekmeier, 70, Cincinnati, hio, civil engineer and member of a mily prominent in the engineering fession for four generations, died ne 18. A graduate of Rensselaer lytechnic Institute, in 1942 he went th the War Department as civil en- eer on ordnance construction. In the st several months he had been em- oyed by William F. MacConnell and . of Cincinnati, appraisers.

Carl Sutton Shirley, 42, civil engi- er of the Los Angeles Engineering epartment for the past 24 years, died cently.

August Moser, 58, former government nstruction engineer who headed sur- y crews that ran the line of the orida East Coast R. R. on its over- as route to Key West 40 years ago, ed at Miami, Fla., June 13.

2d Lt. Clifford C. Hutchinson, form- ly assistant engineer with the Texas ate highway department, died near ichmond, Va., May 18.

George Wiley Jones, 61, for more an 20 years Los Angeles County, alif., road commissioner until his re- ement four years ago, died June 13. r. Jones had spent 31 consecutive years county government service.

Henry L. Howe, 56, American Public orks Association president in 1943, died in Rochester, N. Y., May 31. He had been employed by the city of Rochester continuously since 1912, except during World War I, when he served as lieut., senior grade, U.S.N. He was ordered to inactive duty in 1919, with the rank of lieut. commander, U.S.N.R. Starting as assistant engineer of sewage disposal, he was city engineer and deputy commissioner of public works of the City of Rochester at the time of his death.

Guy H. Sawyer, 63, a graduate of Rensselaer Polytechnic Institute, who for the greater part of his life worked in South America, died recently in Temblador, eastern Venezuela, while with the Creole Petrol Corp., a subsidiary of the Standard Oil Co. of New Jersey. His first job was as assistant chief engineer on the railroad from La Paz, Bolivia, across the Andes to Arica, Chile, where he later became resident engineer.

John H. Meigs, 69, former director of the Department of Wharves, Docks and Ferries in Philadelphia, Pa., and known internationally as a civil engineer, died June 22. During the first World War Mr. Meigs was construction engineer on plans of piers and basins at the Hog Island Shipyard, and later he was one of ten engineers, representing five nations, who composed the Wang Poo Conservancy Board, which surveyed the port of Shanghai, China.

George Hewitt, 68, for the last 38 years member of Lee & Hewitt, a Paterson, N. J., firm of architects and engineers, died June 24. Mr. Hewitt was graduated from Stevens Institute of Technology in 1896. His firm designed and built many New Jersey school buildings. He also served as a consulting engineer in the construction of the naval drydock in Bayonne.

Warren H. Roberts, 81, prominent retired civil engineer of Chicago and engineering alumnus of the University of Illinois, class of 1888, died June 22 at his home in Miami, Fla., where he had been living since his retirement. He was a bridge and structural engineer in Chicago. In 1904, with the late John V. Shaefer, he formed the engineering firm of Roberts and Shaefer, and was associated with the late Lincoln Bush in the auxiliary engineering firm of Bush, Roberts and Shaefer. Mr. Roberts served as civil engineering advisor on several European construction projects. During World War I he served as a colonel in the construction branch of the cantonment division of the Quartermaster Corps.

Realtors challenged on postwar house estimate

Providing homes for newly formed families alone will require the construction of more than 800,000 new non-farm residences each year during the first six years after the war, according to Douglas Whitlock, president of The Producers' Council, in commenting on the recent forecast of the National Association of Real Estate Boards (*ENR* June 1, p. 784) which indicated that the rate of postwar residential construction would not exceed 300,000 units annually.

Pointing out that the total housing need is still greater, he states that there also are at least 4,200,000 substandard dwellings which must be replaced, making the actual accumulated non-farm housing need facing the nation during the six years after the war total nearly 10,000,000 new residential units.

"New homes," Whitlock said, "were constructed at the rate of 515,000 a year during the 5-year period, 1937-41, when nearly 9,000,000 individuals, on the average, were unemployed. In view of the fact that the demand for new dwellings is greater than ever before and since the savings at the command of the American people are by far the largest in history, it seems inconceivable that the rate of residential construction after the war would fail to rise above the depression level predicted by the NAREB."

WEEKLY CONSTRUCTION SUMMARY

CONTRACTS

Continental U. S. Only
(Thousands of Dollars)

	Week Ending July 1 1943	 June 22 1944	 June 29 1944
Federal	$49,988	$20,696	$19,640
State & Municipal	5,297	3,879	9 331
Total public..	$55,285	$24,575	$28,971
Total private.	4,863	3,400	5,506
TOTAL	$60,148	$27,975	$34,477

Cumulative
1944......(26 weeks).......$891,830
1943......(26 weeks)......$1,826,400

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1943 26 Weeks	 1944 26 Weeks
NON-FEDERAL ...	$256,085	$198,011
Corp. Securities..	13,571	85,345
State & Mun....	82 381	56,536
RFC Loans	9,000	56,130
FPHA Loans ...	3,133	.....
REA Loans	20,000	.....
Fed.-Aid Hwy. ..	128,000	.....
FEDERAL	$2,653 838	$245,266
TOTAL CAPITAL.	$2,909,923	$443,277

ENR INDEX NUMBERS

Index base=100		1913	1926
Construction Cost.	June '44	298.72	143.59
Building Cost....	June '44	235.33	127.21
Volume	May '44	100.	44.

Comment and Discussion

Readers' opinions on matters that concern engineers and contractors

George A. Orrok

SIR: Thirteen years of intimate association with George A. Orrok, engineer, have been an experience of rich and lasting value. My appreciation and gratitude for those years, so full of professional inspiration and warmest friendship, can only be exceeded by my daily sense of loss in the passing of "Uncle George."

To have enjoyed this long period of closest association with an engineer of his international reputation and high and generous character, was, indeed, a rare privilege, and one never to be forgotten.

Much has been published regarding his professional life, and his record of extensive and versatile accomplishment. There has not been the slightest exaggeration in any of these accounts, which are a source of pride to his astonishingly large number of friends and acquaintances in the many countries of the world where his work and personality were so favorably known.

I need add nothing to all of this, but as his professional associate and close friend, I desire publicly, to express my admiration and respect for George A. Orrok, and to contribute these few words in honor of a great engineer, a true gentleman, and a very dear friend.

DAVID MOFFAT MYERS,
New York City

Storm Drainage in the Tropics

SIR: Referring to the description of public works in Barranquilla, Columbia, (*ENR* May 4, vol. p. 654), may I offer some comment on the statement explaining the absence of storm sewers in that city. I designed and built storm-water sewers in two cities in Central America and have seen them constructed in several others where rainfall conditions are not dissimilar to those of Barranguilla.

Topographically, conditions at Managua, Nicaragua, are somewhat similar to those in Barranquilla although the latter city is larger, as in both cases the town is built on a hillside sloping down in one case to Lake Managua and in the other to the Magdalena River. The street plan in each case is rectangular with a series of parallel streets sloping at a more or less uniform grade to the shore and intersected by nearly level streets parallel to the shore line. In the design of a drainage system, in Managua it was found to be most economical to place one storm drain in each of the crosstown streets emptying directly on the lake shore. The drainage in the lateral streets being restricted to the distance of one block, ran directly on the surface to the nearest sewer. The total length of each of these sewers was less than a mile and it was found possible without exceeding the size of 42 in. dia. to take care of all but the most intense runoff, a condition that was not likely to last except for a short period of flooding. Normal and even relatively hard rains were entirely disposed of in the storm drains.

Previously I built storm sewers in the Canal Zone, particularly in and around the city of Panama and I have seen their successful operation in the city of San Salvador.

It is doubtful if intensities of rainfall of 8 in. per hr. are encountered in Barranquilla except rarely for short periods, certainly not frequently and for several hours. I am familiar with conditions in that city, as I was engaged in the year 1934 on some of the design and construction described in your article but it was after a large part of the paving had been executed in accordance with the plan to use the street pavement as a water channel for all storm runoff. The resulting condition was not agreeable for street traffic, especially at the channelled intersections and on broken grades.

I have no rainfall records for Barranquilla but have never seen there a greater runoff from city streets than I noted in Managua where, previous to the installation of sewers and pavements, I recorded a rainfall at a 4 in. per hour rate, running in one of the main streets as a solid stream of water nearly a foot in depth from curb to curb with a total dischar for this street of 60 cu. ft. per s After the completion of the pavi the same street was clear of wa except in the gutters during the m intense rains and it was my beli after it was too late to make a changes in the plan at Barranqui that a proper study of runoff con tions there would have permitted design of sufficient stormwater drai at a reasonable expense to take c of all but the heaviest rainfall.

HENRY WELLES DURH

Postwar Designs

SIR: The editorial "Get Out Plans" *ENR*, May 4, 1944 "hits nail on the head" and relates to a s ject that cannot be stressed too oft

There is an old saying "Wh grass grows, cows die" and our tional economic stability and the w fare of the construction industry depend, in the immediate postwar riod, not upon glowing promises things to come, but upon contracts actual construction.

The larger the volume of constr tion necessary to maintain a hi level of employment, with conseque economic stability, in the immedi postwar period, the more adequ the planning necessary to insure t materials needed for that constr tion.

There is no reason to anticipate lack of manpower as our armed forc and war-time production are demo ilized, but to insure the availability essential materials and their distrib tion, to the localities where constru tion work is ready to proceed will doubt call for as comprehensive a adequate planning as was found nec sary to accumulate and distribute t materials necessary for essential w production.

Construction for war purposes rapidly reaching the vanishing poi with the consequent unemployment increasingly large numbers of skill building mechanics. In the absen of rigidly applied laws controlli labor, and the place of its emplo ment, these construction workers w not be available for activities outsi their accustomed trades.

The pent-up volume of civilian co struction which is awaiting the " ahead" signal is increasing daily, a I believe that it is of the utmost i portance that every effort short of i ference with the winning of the r should be made to find the ways d means of establishing the shortest sible interval between the cessa- n of construction for war and the ginning of the construction for ce.

THEODORE IRVING COE
Technical Secretary,
The American Institute of Architects,
Washington, D. C.

ansit Offers Advantages

Sir—M. F. Denault's article in *En- eering News-Record,* May 4, 1944, 680, is interesting, although his guments in favor of the plane table not conclusive.

Many thousand miles of railroad liminary surveys have been run, d it is not known just where a plane le was used on any one of these. e resulting maps, of necessity show- all the topography, were accu- ely made at comparatively low sts.

Between 1907 and 1910 the Dela- re, Lackawanna & Western R.R. de at least four preliminary surveys st of Clarks Summit, Pa., to relocate main line and eliminate distance, and fall and curvature. The line cted and built was a high grade from Clarks Summit to Halstead, ralleling the old line but at one int several hundred feet higher.

One of the aforementioned prelim- ry lines extended from Nichols, Y., near Waverly, to the Nicholson nel, some ten miles west of Clarks mmit. The territory mapped ranged om 800 to 2,000 ft. in width over a etch, including spurs, nearly 60 les long. The territory—probably percent cleared, the remainder re or less wooded—was hilly with ny side hill slopes of 4:1, 3:1, and en steeper, there being some level d along the streams.

It was decided that this should be stadia survey. Preliminary to the tual survey, levels were run from d to end of the proposed line, bench rks being established at about $\frac{3}{4}$-mi. tervals. The level party naturally llowed the highways wherever pos- le. It is interesting to note that, twithstanding some 10-percent ades and ascents and descents of er 250 ft. or more, this work was mpleted in $6\frac{1}{2}$ working days. The tfit consisted of a cook wagon, a nk wagon, team of mules, the driver, a cook, three rodmen, a notekeeper, the transitman and the topographer.

A stadia transit line was run for a day or two by deflection angles, the computed bearings being checked by needle readings. The accuracy of this stadia line was checked as often as possible by readings on the previously established bench marks. This line was plotted to a scale of 400 ft. to 1 in. on the sketch board size sheets (about 18x24 in.), the sheets being ruled in 1,000-ft. squares. A pencil line meridian was drawn through each transit point for use in plotting topography shots. The sketch board was equipped on the back side with a waterproof envelope with flap. This carried the map sheets, protractor and other equipment of the topographer.

The 180-deg. protractor for plotting side shots was provided on its diametral edge with an accurately positioned hole in suitable material so that the protractor might be pivoted about a transit point. Its diameter was graduated from this center both ways, the semicircumference being graduated from zero at the extremities of the diameter to 90 deg. The topographer also carried a scale, triangles and a table of tangents and cotangents so that auxiliary transit points, spur lines or an extension of the transit line itself might be accurately plotted if necessary.

The procedure on side shots was as follows: The transitman made an observation, called out the rod reading, vertical angle and bearing, using a stadia slide rule to obtain the horizontal distance and difference in elevation, all of these being recorded by the notekeeper. In the meantime the topographer had set the protractor at the proper bearing, spotted a point along its diameter at the horizontal distance and jotted down the elevation of this point, the elevation by this time having been computed by the notekeeper. After several points were plotted, contour sketching began. Contour sketching applied also to roads, streams, buildings, etc. The sheets were inked in nights or on rainy days.

The area mapped was over 6,000 acres. The entire cost—meals and shelter, transportation, payroll and equipment—was about $2,500.

The purpose of the resulting map was to estimate the cost of a paper location projected thereon; and to determine the increase or decrease in distance, curvature and rise and fall over the old line due to this location. It served its purpose well.

Geo. J. Ray at that time was chief engineer of the D. L. & W. R.R.; R. M. White was division engineer; Ralph Sherwin, assistant engineer; the rodmen were C. D. Price, Francis Holleran and Spike Stewart; Walter Frick was notekeeper; Harry K. Wilson, transitman, and the writer topographer.

C. A. JAMES

W. C. Whitehead

SIR: News of the death of W. C. Whitehead, C.B.E., M. Inst. C.E., chief engineer, Birmingham, Tame and Rea Drainage Board in Great Britain, has just been brought to my attention.

Many years ago, Mr. Whitehead succeeded John D. Watson as chief engineer of the district, and continued the revolutionary changes in sewage treatment instituted by his predecessor. Under these engineers the Birmingham disposal works has become notable for advances in the art of sewage treatment.

When Mr. Watson took charge of the works at the turn of the century, the drainage board was operating the largest of the many sewage farms in England, comprising 2,830 acres of land, of which 1,784 were utilized by broad irrigation. The sewage was first treated by chemical precipitation. The latter soon gave way to plain sedimentation, with the use of septic tanks to further reduce the sludge burden on the land. In the progress of time, various improved means of sewage treatment were introduced (See *Engineering News* late 1904 or early 1905, and *ENR* Mar. 9 1930, p. 399).

I am indebted to Walter W. Bennett, chief clerk of the Birmingham, Tame and Rea District Drainage Board, for news of Mr. Whitehead's death, which occurred on May 3. He adds: "I had a conversation yesterday with my old chief, Mr. J. D. Watson, and he appeared to be very 'fit'."

Mr. Watson entered private practice as consulting engineer at London and Birmingham soon after his retirement from the drainage board. Several years ago he was president of the Institute of Civil Engineers.

M. N. BAKER,
Upper Montclair, N. J.

EDITORIALS

VOLUME 132 NUMBER 26

June 29, 1944

Seabees Earn Their Stripes

TOO MUCH CANNOT BE SAID in commendation of the Navy construction personnel in uniform, namely, the Seabees. This force, quite unlike anything heretofore in existence, has attracted to it many of the best men the construction industry had to offer and has provided a means through which a large number of men from that industry are meeting the challenge of war to good advantage. The program of warfare now has been stepped up to a point where forward movement in remote fields of activity depends largely upon advanced bases. The Seabees are taking talents developed on large peacetime construction projects to this advanced base work. The excellent results arise from a combination that probably would be possible only in the United States: manufacturers applying quantity production methods to specially developed equipment that a large body of armed workers use in applying the skill and experience of the construction industry to the Navy's war projects. This combination of men and machines has added something new and vital to the execution of warfare.

Road Legislation Needed

CONGRESS RECESSED without passing the postwar federal-aid highway legislation that finally emerged from the Roads Committee of the House during the last-minute rush to clear up pending matters before going home. This legislation has been under consideration for more than a year, the long delay being due to inability of state highway officials to agree on how the federal aid should be distributed among the states and between urban and rural areas. That disagreement was not without its salutary effect, but it seriously delayed final action on a bill that the Roads Committee would report out. Also, it set back all state planning because of uncertainty as to the amount each state is to get. In its final form the bill provides much less federal aid for postwar highways than many highway authorities believe essential if highway building is to carry its full share of the postwar readjustment job. Now, however, the essential thing is to get at least an initial postwar highway bill passed so that the state highway departmen can place definite programs before their state legi lative bodies next year. Forty-five of the state le islatures meet during the winter, hence it is esse tial that these programs be in shape for approva Congress, therefore, should be urged to give th pending road legislation early attention.

Stimulus for Postwar Sanitation

PERHAPS THE STRONGEST IMPETUS that can b given to effective postwar public-works plannin is to establish the legal, administrative and fina cial framework for the support of a program. Th principle has long been recognized in plannin for federal-aid highway work, and legislation t implement postwar road work now is ready f Congressional action. Another gratifying step fo ward in postwar planning is the drafting of a bi defining federal participation in stream pollutio abatement, (ENR June15, Vol.p.855). This bi H.R. 4741, would establish the legal and admini trative machinery for initiating such a program and provides for sizable grants-in-aid and loans t the states, as well as to private industries, for th control of pollution. Early action on this measur which incorporates the best features of similar bil that have been hotly debated for many years i Congress, would go a long way toward implemen ing postwar sanitation programs.

Inexcusable Failures

THE FAILURES of elevated timber water tanks a two different Baton Rouge, La., housing project within a period of less than two months, as note in our news pages of May 25 (p. 772), can onl be classed as inexcusable. Where the blame lie has not been officially determined, but it can probably be spread rather broadly, for if the tower timbers were not "sound, dense stock at the origina time of construction," as one investigator charged someone should have rejected them. It is noted that the tanks were "temporary", and that it wa intended to replace them with steel constructio as soon as such material was available. But eve temporary construction must be safe. Moreover the experience of many railroads in using timbe water tanks for permanent construction is proo enough that timber tanks can be made safe. Th Baton Rouge tank failures do not, therefore, indic timber, but they do emphasize the necessity fo using care in the selection of a material that i inherently non-uniform. Aid in this selection i readily available from responsible timber interests, both through their grade marking practices and their technical service departments. Under such conditions there is no excuse for faulty timber being used in any engineering structure.

Alloy Steels and Unit Stresses

SUBSTANTIAL INCREASES in alloy steel manufacturing capacity, as a result of the war, has naturally led to speculation on the increased use of such steel in postwar construction. Discounting the views of the enthusiasts, who envision an alloy-steel age, in which everything will be built of such high-strength steels, it is nevertheless probable that structural designers will have to know much more about such materials than they have thought necessary in the past. A fundamental question is sure to encompass the problem of unit stresses.

Low-alloy steels, as those know who worked with the many proprietary types that were appearing on the market just prior to war, have a high yield strength and often a very small margin between yield strength and ultimate. Unit stresses, therefore, must be based on quite different rules than govern structural carbon steels having a definite yield point that is about one-half the ultimate strength. Furthermore, a pinch of this or that alloy changes the yield strength or other properties, hence every steel is a problem unto itself. The difficulty involved in incorporating rules for such materials in building codes is obvious. As a corollary, the need for informed judgment on the part of the designer is greatly increased.

As an example of some of the problems that will arise as we seek to take advantage of the useful properties of alloy steels, the design of long silicon-steel girders in one of the last bridges built before the war stopped such work may be cited. The usual basic unit stress of 24,000 lb. per sq. in. governed, but reductions were deemed necessary at various locations in the span because of uncertainties as to reactions and differential temperature effects. One of these reductions was made to increase the rigidity of the girders, which otherwise were too flexible, a direct result of using an alloy steel. By the same token, use of an alloy steel that would permit stresses higher than 24,000 lb. might readily be justified for parts not affected by flexibility, and whose resultant smaller section would not be dangerous from a corrosion or fatigue standpoint. At the same time points of stress concentrations would be more critical when hard steels are used.

Silicon steel is, of course, a relatively familiar product. The problems that will be presented when there are dozens of other alloy steels, each with its own properties, may be expected to be much more complex. The only solution for them rests in extensive research and slow accumulation of experience in their use. We have that experience with structural carbon steel, which has proved to be dependable whenever it meets strength and ductility requirements. But there is no such certain and simple proof of dependability where alloy steels are concerned. Here is a postwar job into which both producers and potential users can turn their best efforts at the first opportunity.

Self-liquidating Slum Clearance

SOON, WE EXPECT, SOMEBODY will be doing something about the weather! This observation is prompted by the report on the self-liquidating slum clearance project at Laredo, Texas, described in this issue. If the project can be carried forward in the manner now proposed, the poor who now live in the area are not to be uprooted but rather are to become the owners of new and valuable homes at a small weekly cost well within their means.

This project is not to cost local or national taxpayers a cent. It is not subsidized, but rather is planned as a business proposition which can be put under way without waiting for federal money for planning, for a grant to buy the land or a subsidy for building, and without a continuing dole for operation of a project under which the tenants become regimented, special-privileged wards of the government. Increases in land values in what is now a squalid slum area resulting from complete reconstruction is expected to make it possible to finance the whole operation through loans on which the only down payment will be the present value of the land. Construction costs are to be kept low by mass production methods.

The "Laredo plan" doubtless is not applicable to many slum areas, nevertheless, the principles on which it is based are sufficiently challenging to warrant re-examination of many slum-clearance projects now calling for large subsidies.

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ENGINEERING ABROAD AS SEEN BY ENR EDITORS

Seabees Speed Construction in Pacific

N. A. Bowers
Pacific Coast Editor, Engineering News-Record

***Contents in Brief**—The Navy's Construction Battalions, now in their third year, earn high commendation for closely following up combat troops with latest methods of contractors and large size equipment in the hands of skilled operators trained for defensive combat. Data are presented on organization, plan of operation and methods of using equipment that have brought to a new high the speed of construction at advanced bases. This is one of a series of technical articles on Seabee activities observed by the author in the Pacific.*

SPEED IS THE KEYNOTE of the highly important part that Seabees are playing in the war out in the Pacific and similarly speed has been an outstanding factor in the growth and development of this new organization. From nothing more than a plan a little over two years ago, crystallized into quick action by the disastrous experiences of our civilian construction forces at Wake and Guam, this new arm of our military service has mobilized more than a quarter million men and has rolled up an enviable record of achievement while building the advanced bases so essential to the success of modern warfare. The plan was conceived by officers of the Civil Engineer Corps, U. S. Navy, who worked out a training program for the large number of recruits, took over the task of instruction and are now leading the battalions in their operations in the field.

This opportunity to share in unprecedented construction work, perhaps the most important of all time, is improving the value of the men now serving as Seabees, to the industry they represent. When they return to the places whence they came (state highway departments, contracting firms, machinery service companies, etc.) they will bring with them a background of experience that has been varied and broad. Petty trade jealousies have been ironed out

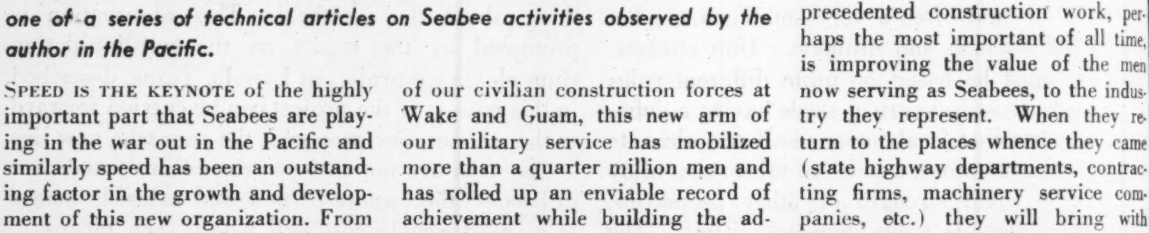


Fig. 1. Heavy going in soft foundation is typical of earth moving jobs in Pacific theaters of operation.

nd new and better methods have een developed; what these men have one through has strengthened them character. The construction inustry contributed to the war the ery best it had in men and equipent; the return to that industry will e a wealth of experience of the kind at seasons and balances men's skill nd judgment.

Never before in the history of enineering has there been anything ke the Seabees. They bring to miliry activity, skill and experience eretofore used only in peace-time ursuits and much of which has been eveloped only in recent years. Thus hey not only fill a great need but hey come at just the psychological ime.

By use of methods which transform nd modernize the construction hases of warfare, they are demontrating to other arms of the service nd to the world at large the value nd importance of the construction ndustry. This has caught the popur fancy and, overnight, has made he organization famous. More than hat, it has won friends and appreiation.

A remarkable friendship has prung up between Marines and Seaees. They're buddies in a very true ense—even to the point where they an "kid" one another without leavng resentment. An illustration is the lleged instance of the first Marine o land on Island "X" being greeted y a Seabee with the query, "What's een keeping, ya, Bud?"

President's tribute

Official tribute from the commander n chief of the Army and Navy is in he President's praise of the Seabees n the second anniversary of their rganization. He said, "I have folowed with personal interest and admiration your records of achievements at home and on all of our fightng fronts. Your war effort is outtanding because you accomplish hree great purposes which enable ur fighting forces to carry on the offensive. You build, you fight and you repair. You are prepared to repeat the operation wherever necessary—you go forward together. I congratulate you and wish you good luck and God speed."

So much for a general statement of achievement and recognition, since the origin and purpose of the new "outfit" were described in the article "The Seabees are Coming", published in *Engineering News-Record* Sept. 24, 1942, p. 65. In the following, which is an introductory to a series of technical articles covering activities of the Seabees in detail, is presented an outline of how this organization has adapted itself to the military needs of the times, how new methods and equipment have been developed and how all-time speed records are being made.

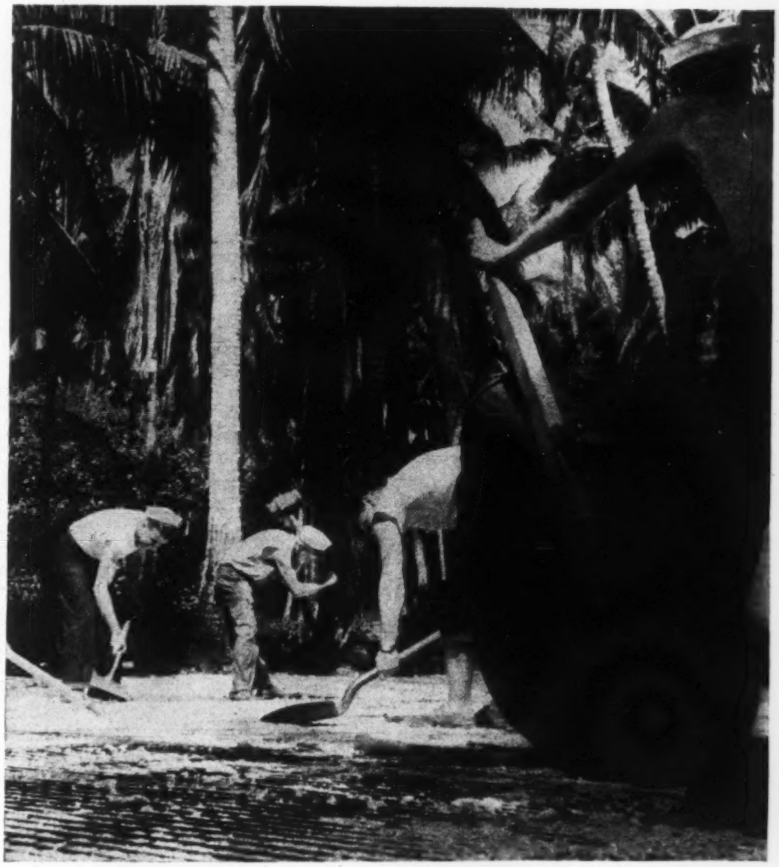


Fig. 2. Hand work supplements heavy equipment only when necessary, but the workers are always willing.

Plan of organization

Even before we entered the war, construction activities had become the most important factor in sustaining the advances of combat troops. But construction near the front was being done with equipment of small size, chiefly because it "could be transported easily". It was operated by men trained primarily as soldiers. Often they operated it only fairly well.

Naval construction battalions changed all this in one fell swoop because the basic idea back of this organization was to get quickly into uniform men whose primary qualification was a knowledge of the construction industry. These men were given a short-course in military training and then were sent, with modern equipment, to build advanced bases.

They soon made it apparent that the speed wanted could be had with nothing less than the largest size construction equipment. This demand changed the methods of battalions trained for stevedore work so that, instead of 5-ton loads, they soon were equipped to take 35-ton loads off the ships and set them down on hostile beach heads. (This is the subject of one of the articles in this series). In the transportation field, as elsewhere, a seemingly providential timeliness brought into the picture the necessary landing craft (LSTs, LCMs, etc.) which had been under development and were made available by the Bureau of Ships.

The work to be done calls for men of special training and experience,

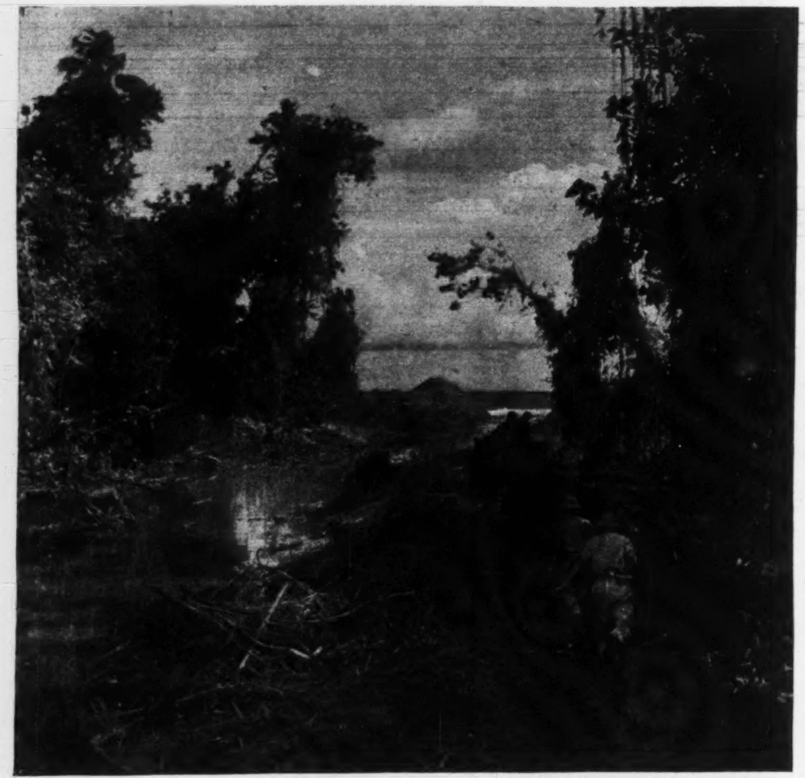


Fig. 3. High water table makes wide drainage ditches (at top) a prerequisite to construction. Until drainage is established all transportation is difficult.

hence men who are, as a rule, older than the average draftee or enlistee. Correspondingly, to develop this asset to best advantage, a plan of management was worked out differing from that prescribed for regular troops.

The usual military subdivisions are used by the Seabees, i.e. battalions are divided into four companies and a headquarters unit of about 200 men. The officer in charge of each company is expected to be familiar with abilities and qualifications of each man. This information is useful in getting each man effectively placed where he fits. Each company is ma up to operate as a self contained un and all companies include men wi specialist experience. Always the are ample units with long experien in moving materials, clearing fore cover and in grading for roads airstrips.

Initiative encouraged

As these forces work in the fiel their activity follows more along th line of a large contractor's orga zation than it does the routine of th usual military unit. Despite the fa that the monetary profit motive now entirely out of the picture, the men retain the instinctive search fo efficiency taught by that motive. Fo example, an expression common heard when some operation is not g ing as well as it should is "We can make any money doing it this way and then their ingenuity works o some scheme for improvement.

There are two significant points i this: (1) even in the midst of th wastefulness of war, these men a applying the economy of peacetim competitive operation to speed the work and (2) there is great adva tage in managing these troops so th this interest, initiative and ingenuit of the individual is in no wise smothered or discouraged by any rigidit in military control that would be r strictive. In short, it is recognize that control and management of th Seabees should be different from th prescribed for companies of me drilled and trained solely for comba

However, these men do get militar training—and they have need for i At Guadalcanal, Tarawa, and elsewhere, construction battalions debarked with the early waves of combat troops, started construction wor while the fighting was in progres and had badly blasted Jap airfield ready for service a few days afte the attack on the bases began and a a time when the areas were still decidedly in the battle zone. Seabee casualties at Tarawa and elsewhere plac this organization definitely in th combat classification.

What seabees do

In addition to the five component into which each battalion is usuall divided, there are numerous subdivisions along other lines, accordin to professions and skills. For a special job men are drawn from any

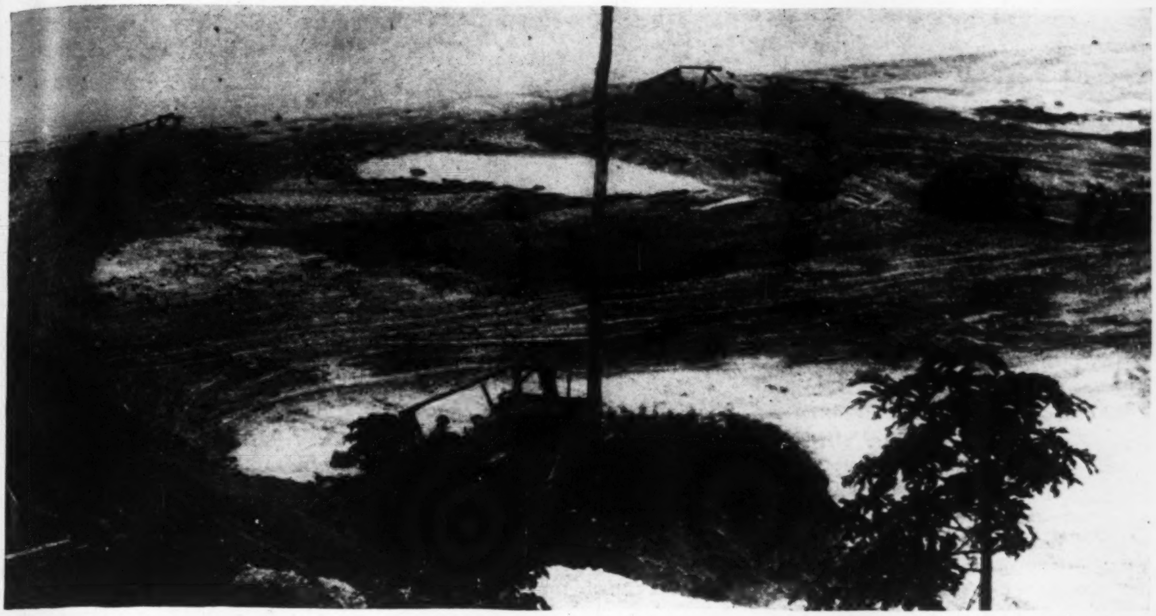


Fig. 4. A continuous circuit of 14-cu.yd. "pans" brings coral from a hillsile deposit to a low spot on the edge of an airstrip.

company to make up the special unit. Here are some of the more frequent subdivisions: heavy equipment (all heavy construction equipment except trucks); transportation (all rolling equipment, including dump trucks); structural (carpentry, bridges, huts, saw mills, furniture); plumbing (water supply, tanks, pipe lines); rigging; diving; paintshop and engineering (maps, drafting, surveys, slope stakes). The "overhead" officers and their staffs include medical, disbursing, supply and commissary, chaplain, labor co-ordinator, personnel and ship's service which includes store, laundry and barber shop. Communications takes care of telephones, radio, signaling, mail and censorship.

The percentage of a battalion that will be on actual productive work, on the average, is 67 to 70 percent; say 700 men per battalion. This, it is to be remembered, is in an outfit required to be self-sufficient in all respects. The functioning is arranged so that it is smooth and efficient like that of a team, well-trained and equipped. On one occasion a general who had come over from an Army camp to see how a Seabee outfit was set up, talked with enlisted personnel extensively and completed his inspection with the remark that despite the relatively small size of the unit they seemed to be ready for anything "from astronomy to obstetrics."

The general had jokingly stated a broad truth in that there is no practical limit to jobs these lads will tackle—indeed, to which they are often assigned simply because no one else would be at all likely to accept the assignment. They repair torpedoed ships, blast out ship channels, install steam or ice plants, operate saw mills, build generating stations from abandoned Jap electrical equipment and always and endlessly they overhaul and recondition machinery of all sorts brought to them hopelessly broken down.

One maintenance depot, set up and equipped as a base for the repair and maintenance of 100 trucks and 100 pieces of heavy equipment per month, is regularly doing three times that amount of work, including many operations never thought of as maintenance—for example, the realigning of twisted motor truck frames and the welding together of the parts of broken rear axles.

A frequent Seabee assignment is setting up gun emplacements for defensive purposes even before an enemy stronghold nearby has been captured. Stevedore detachments often set up temporary wharves, unload arms and ammunition and then prove by a speedy second move with specialized equipment that they fully appreciate the urgency of getting these supplies off the beach and to less vulnerable spots as quickly as possible.

Although assembled as a group in which each man is a specialist in his own field, the individual Seabee, by virtue of being part of a self-sufficient unit, has unusual opportunities. Not only is he in a position to observe, but often he is called upon for emergency aid in, activities outside his specialty. Thus he sees, as one participating in the operation, how the job is done.

Speed replaces profit objective

The secret of Seabee success is the old formula of having the right man and the right machine for each job. This was a prerequisite to the prewar contractor's profit, and the same underlying plan is making construction jobs go well at the front just as they did at Shasta Dam or on a state highway contract.

In selecting Seabee equipment the order has been for units of the largest size that could be worked to advantage. Big units make for economy. At the front the "economy" is in terms of time, not money. D8 tractors, 14-cu.yd. pans and corresponding sizes in other rigs do well on island base work and they can be delivered by LSTs that will land them on a beach near the job.

Getting the equipment to the job, difficult though that may be, is only a start. Dust that cuts bearings, frequent immersion in salt water, unprecedented stresses that overload

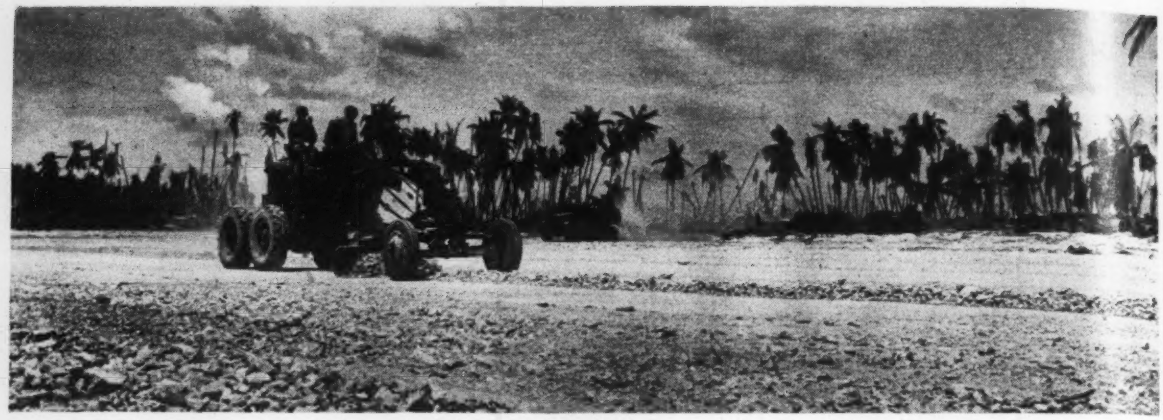


Fig. 5. On the Tarawa airstrip, trucks and motor graders quickly cleared away the rubble left by battle.

and 24-hr. operation soon take their toll. Repair shops are manned by three shifts of mechanics who sweat and swear over their precious units all day and all night. Tractors, the most valuable single item on the long list, are needed so badly that they must be kept in constant service. But they do break down. Often quoted in emphatic despair is the manufacturer's comforting assurance(?) in a footnote of the instruction book which says "There's a Caterpillar dealer near you."

Lack of spare parts

The practice of "cannibalizing" parts from other equipment of the same make and model, will work only for a few unusual breaks. The more frequent breaks come in weak spots, characteristic of the particular model, and soon all units of this model are out of service for lack of this one item. It is well known that in tractors made by manufacturer "A" the clutch can be expected to go first; those made by "B" are weakest in the crawler treads; the "C" truck has its weak link in the rear axle and so on.

To keep equipment in service so far from the factory requires unbelievable ingenuity and resourcefulness. As experience accumulates, methods improve. The most astonishing substitute parts, made of pieces from the scrap pile, often appear as if by magic. Where three-shift operation is necessary and all units are busy, a popular plan is time out for inspection and checking at the end of each shift. The grease truck is constantly on the job and any need for shop work gets immediate attention, regardless. Where speed means everything and only the big machines can give speed, no amount of care is too much to give these machines.

The greatest difficulty in maintenance, of course, is in the matter of spare parts. At first much equipment was idle for lack of them. Now, *two* lots of spare parts go out with each piece of equipment shipped: (1) the "fast-moving" items of ordinary repair and (2) everything else needed up to but short of a major overhaul and rebuild job. Parts for jobs of the latter type are now procured as required from parts depots nearby. Someone has paraphrased Churchill's saying to make it apply to the Seabees by predicting for them "blood, sweat, tears, and a lack of spare parts."

Fig. 6. Native workers in the Marshall Islands are relatively good physical specimens.

Simple equipment preferred

On carrying-scrapers (universally shortened to "pans" out in the Pacific) the hydraulic control mechanism is unpopular because of (1) the difficulty with hose connections on rough, remote work and (2) the many parts that may require replacement. The cable-operated rigs are much preferred and even the simple cable assemblies are made up in spare form to permit quick replacement when wear reaches the danger point.

The typical construction battalion takes with it materials as well as equipment (allotments for special assignments are extra) that it is expected to need when it reaches the scene of its field activity. How much is required may be visualized from the fact that, stacked carefully in one of the ABCDs (advanced base construction depots) it covers about two acres. Landed on a beach head where haste necessitates a minimum of stacking and accessibility dictates roads around the piles, the area used is more nearly 10 acres.

Personnel and morale problems

Personnel problems in an organization of this sort differ from those in the Army. The first requirement of management is leadership with a knowledge of psychology, sympathy for the point of view of the men and ability to fit the right man into the right place. The most successful management makes use of what company commanders know about the individuals.

Recreation facilities, especially for the hours between the evening meal and bedtime, are important. Movies have met this need best and most camps have movies two or three evenings a week. Camp sanitation and comfort are specially important. Comfort can be rated, for these men, more as a necessity than a luxury. Where rainfall is heavy and the ground is wet much of the time, it is agreed that tents (if used) should have floors off the bare ground.

Away from combat areas, living in unpleasant and unhealthy surroundings and lacking the incentive of action in the military sense, personnel problems sometimes reach an acute stage. In one case where long hours in a remote location had continued with no relief nor recreation for a long time, morale dropped to an unusual low.

As a remedy every one of the men in the unit (some 250) was invited to discuss grievances privately with a superior officer who came in from outside the company for this purpose. Nine tenths of the men did so and they all told practically the same story. The desirable morale was restored by a new camp atmosphere, regular movies and a future objective that gave the men something to look forward to.

Even in battalions under the best management and fortunate enough to go promptly to where they have the incentive of front line excitement, there is a "cycle of efficiency". This seems to be closely related to home ties and future prospects. The Seabees are not professionally military men: their tendency is to look to other things for their occupations in postwar times.

From entering boot camp to maximum efficiency in a battalion out in the theater of operations takes five or six months. Then the men want to "do something", and good management sends them, promptly if possible, to some forward area to a job in keeping with their talents and equipment. Some 18-mo. or two years after enlistment the average efficiency curve is sloping downward: the man's thinking is turning primarily toward home. At this stage efficiency should be renewed for another period of service, although the exigencies of military service, the lack of shipping space, or the fact that the men cannot be spared, may forestall such a move.

Thus, the desirable cycle, after boot camp, is assignment to a succession of jobs, interspersed with such rest periods as may be feasible, culminating in home leave when they can be spared. After home leave the men can be expected to re-assemble, get their gear in shape and prepare for another series of assignments out in the field.

A sidelight on this program is the danger that on work other than that at the front, there is almost inevitable tendency for someone to want additional work done. This may be asked for in the form of "dressing up" the properties built, doing maintenance or extension work and otherwise continuing the use of Seabee manpower and equipment.

Where there is legitimate claim to continuation of service in an operating capacity, a call is sent out for a CBMU (construction battalion maintenance unit) which has been specially trained to maintain and operate. This plan keeps the regular battalions mobile and allows them to move on to work at new advanced bases for which they are specially prepared, meantime not neglecting the need for keeping up that which has just been built.

This policy of keeping the battalions where they can render the highest service has been clearly established by Rear Admiral C. H. Cotter, CEC, U.S.N., who has earned widespread popularity among the Seabees in the capacity of Dirpacdocks (Director, Pacific Division, Bureau of Yards and Docks, U. S. Navy). His terse instructions to a battalion are: "Get in; get done; get out." Only in this way can the unit be kept available for the important function of work "up forward".

In subsequent articles of this series will be taken up separately and in detail, features of Seabee activities selected from the long list because of their value as guides for future work in similar lines. The next article to appear will have its two parts in one issue. Part I, "Building Coral Airstrips on Pacific Islands" is a first-hand report on what has been accomplished with this new material at advanced base airfields. Part II, "Coral Deposits that Yield Surfacing Material", compiled by a high authority on this subject, gives information useful in finding and recognizing useable coral deposits.

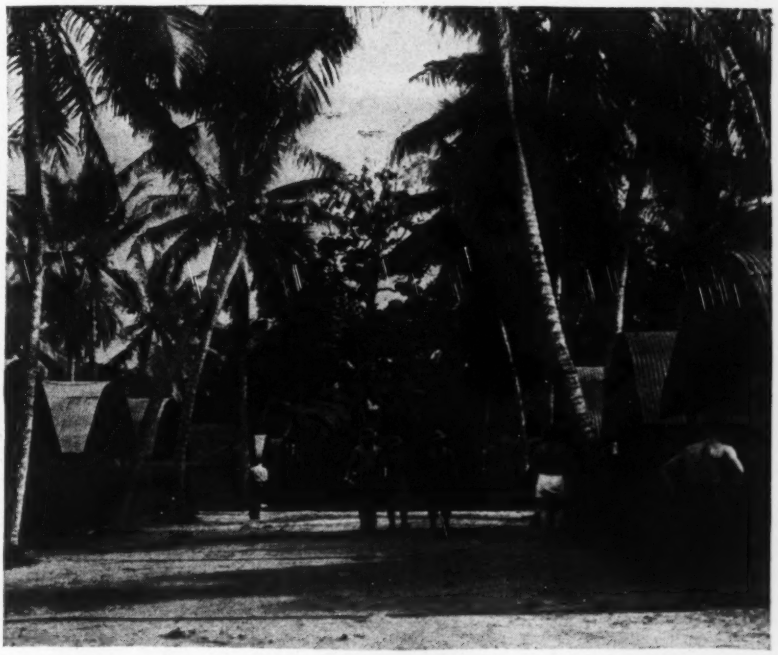


Fig. 7. Well-ventilated Quonset huts are as well distributed over Pacific Islands as are the Seabees who use them so effectively.

Fig. 1. Bituminous asphalt for resurfacing and repairing streets is mixed in a city-owned plant at Jackson, Miss.

Street and Sewer Maintenance Hints

Some very necessary items of street repair and maintenance are being produced with considerable success using city-owned equipment and hired labor at Jackson, Miss. The products include cold-mix asphalt for resurfacing and patching street pavements, and reinforced concrete manhole rings and covers, sewer inlets and gutter gratings.

Production of the bituminous asphalt by city equipment is strictly on an economy basis. Development of the reinforced concrete sewer appurtenances was necessitated by priority restrictions on critical metals formerly used in such structures.

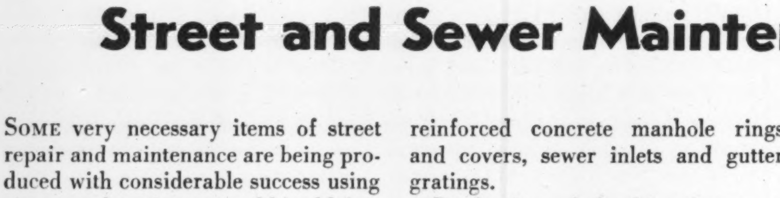


Fig. 2. One concrete gutter grating, one sewer inlet with cover, and one manhole ring with cover are cast simultaneously on a vibrating platform.

Home-made asphalt plant

Equipment for the asphalt mixing plant includes a 10,700-gal. steel storage tank, 200 lin. ft. of 1½-in. pipeline, a steel drum for measuring the liquid asphalt and a small mixer formerly used for concrete.

Cold-mix asphalt is made by mixing 1 gal. of emulsified asphalt per cubic foot of No. 7 pit run slag. The liquid asphalt is trucked from tank cars at a nearby railroad siding to the storage tank which is mounted 10 ft. above ground on concrete supports. From there it flows by gravity to the steel measuring drum at the mixer. After thoroughly mixing the emulsified asphalt and slag in the concrete mixer, it is wheelbarrowed to the stockpile.

As a general rule, during warm weather the asphalt is allowed to remain stockpiled for at least 2 weeks before being used for street surfacing and maintenance. In cold weather this period is extended to at least 30 days. With the slag costing only $0.50 per ton, f.o.b. Birmingham, Ala., city officials estimate the completed product costs not more than 50 percent of the cost of commercially produced bituminous asphalt.

Although not claiming to be pioneers in the field, Jackson's engineering crew has developed a very workable procedure for precasting reinforced concrete sewer inlets, and manhole rings and covers. No critical steel is used for reinforcement. Abandoned steel-angle fence posts reinforce the exposed face of the sewer inlet structures while reclaimed paving rods reinforce the other units.

One corner of the city shop houses the concrete-casting equipment. All concrete is vibrated in steel forms. The vibrating platform, measuring 8 ft. long by 4 ft. wide, accommodates five casting units which permits the simultaneous casting of a gutter grate, an inlet box, an inlet cover, a manhole ring and a manhole cover. A manually-operated hoist overhead removes the concrete units after they have hardened sufficiently to prevent breaking.

Concrete used in the work is designed for a 4,000 psi. compressive strength at 28 days. Considerable difficulty was experienced at first with the concrete bonding to the steel forms, although they were well oiled. This difficulty was overcome, however, by painting the forms with a mixture of stearic acid and kerosene.

Manhole covers carry 12 tons

Manhole rings provide a 24-in. dia. clear opening. They are 6 in. thick, 8 in. deep and are reinforced with two ⅜-in. steel hoops. Manhole covers have a 2-in. edge thickness and 8 ribs. Each rib is reinforced with a ⅜-in. steel rod welded to a small ring at the center and to a large ring of ⅜-in. steel rod near the outside face of the cover. Covers are designed to support a 24,000-lb. wheel load.

Inlet boxes provide a clear opening 4 ft. wide and 8 in. deep. Rear and end walls are 4 in. thick, and the latter are each reinforced with two ⅜-in. steel rods. The front edge of the 1½-in. thick inlet cover is reinforced with two 1x1x1¼-in. angles, welded together. Gutter grates are 14 in. wide, 6 in. thick and 4 ft. long, reinforced with four ⅜-in. steel rods running longitudinally.

Although the manufacture of these concrete sewer inlets and manhole structures was adopted as an emergency measure, the city intends to continue their use after the war.

Another precast concrete product made by the city engineer forces which has met with considerable favor is a table top for installation in the city parks. Cast directly on a smooth section of the concrete floor in the city shop, these unreinforced 9 ft. x 5 ft. x 1¾ in. slabs are used for outdoor ping-pong tables as well as for picknicking. Mounted on sturdy 4x4-in. wooden frames and timber posts set well into the ground, they blend well with the landscape yet defy any ordinary act of vandalism.

All asphalt-mixing operations, as well as street repairing and resurfacing, and the casting of the sewer inlet structures is under the direct supervision of Josh Halbert, director of public works and city engineer of Jackson. E. R. Dickerson and E. T. Thomas, assistant engineers, developed the concrete-casting equipment and asphalt mixing plant.

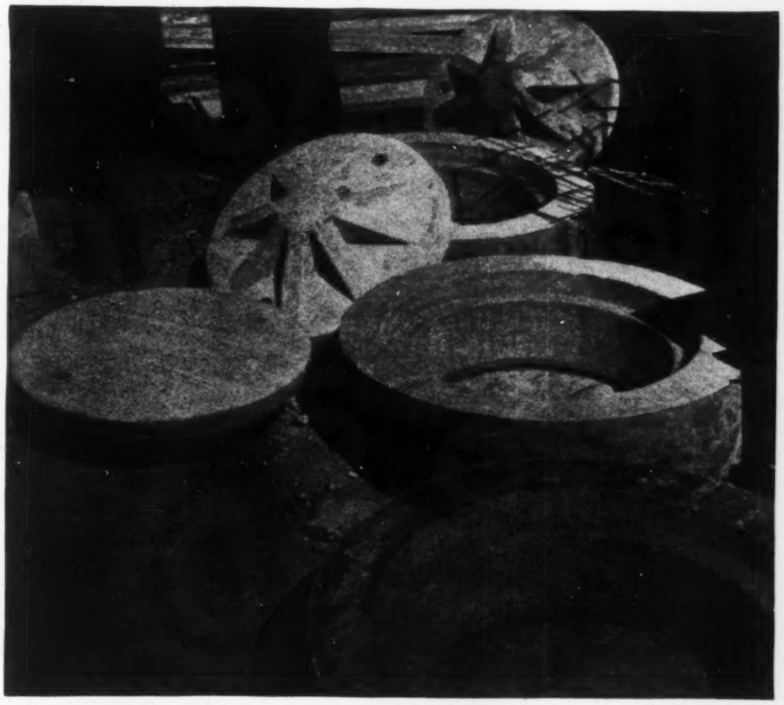


Fig. 3. Precast manhole rings and covers are reinforced with reclaimed steel.

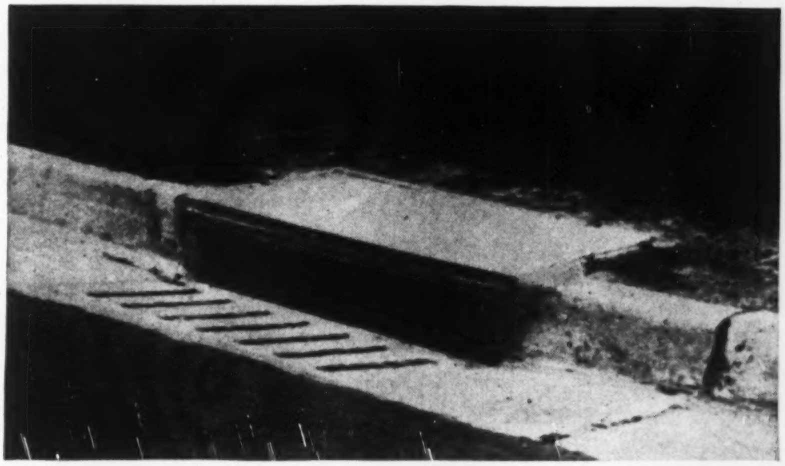


Fig. 4. When installed, the precast concrete inlets provide a clear opening 4 ft. wide and 6 in. high. Gutter gratings also are precast concrete.

New Bridges Speed Washington Traffic

Harry J. Engel
Staff Member, Modjeski & Masters, Harrisburg, Pa.

***Contents in Brief**—Flow of traffic to the Potomac River bridges in the Nation's capital was improved greatly by the construction of several bridges along 14th St. and an extension of Independence Ave., all the work being designed with care to provide finished structures of pleasing appearance. A light, reinforced-concrete, rib-type structure of three 56-ft. span rigid frames masked with stone-faced arched curtain walls was built at one location. For a parallel three-span bridge, reinforced-concrete continuous tee-beam construction was used. At a third location groups of continuous steel-beam spans were built. Three stone-faced, barrel-type, rigid-frame overpasses also were constructed.*

TRAFFIC CONGESTION has been relieved in crowded Washington, D. C., by a number of new bridges that have been built to expedite movement to two Potomac River crossings. A saving of 30,500 car-minutes per day was made possible by erection of one group of bridges. The relief at other points also is pronounced. In addition to the benefits provided, the bridges are of interest because of the measures followed to combine beauty and utility and to permit construction to continue despite slow material deliveries.

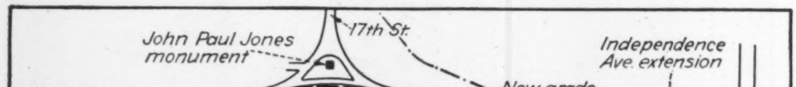

17th St.
John Paul Jones monument
Independence Ave. extension
To Arlington Memorial bridge
New sea wall
New grade separation
New bridge
15th St.
14th St.
1871 River bank
D St.
Future ramp
Tidal basin
N
Maine Ave.
New grade separation structure
Outlet gates
Ramp
Jefferson Memorial
Hains Point exit
Inlet gates
POTOMAC RIVER
Penna. R.R.
0 200 500
Scale in Feet
14th St. bridge

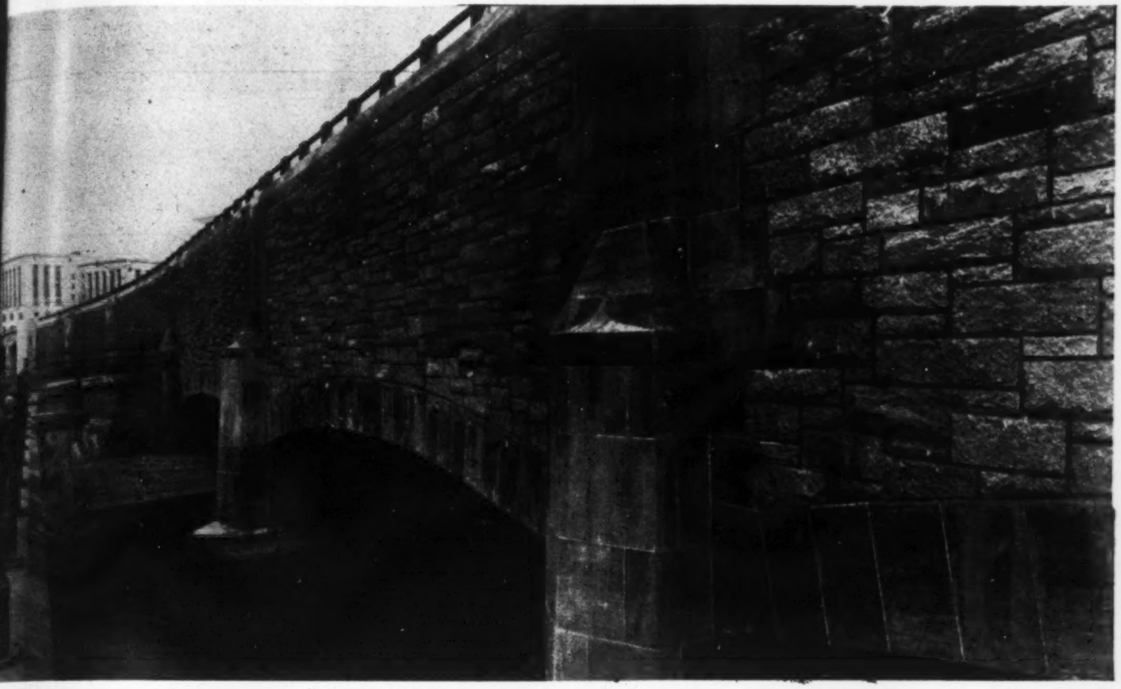
Fig. 1. New construction, shown by heavy lines, extended Independence Ave. and removed a bad bottleneck on 14th St. Because of the location of the bridges, much thought was given to the harmony of the finished structures with other nearby construction.

All the structures are located in the Tidal Basin area (Fig. 1) on ground reclaimed from the Potomac River that as late as 1871 extended to a shore line northeast of Maine Ave. They were built as two projects. Construction of grade separation structures to facilitate the movement of traffic along 14th St. to the 14th St. Bridge across the Potomac was one project. The other structures were built to extend Independence Ave. and thus improve traffic flow to the Arlington Memorial Bridge.

Fourteenth St. formerly crossed Maine Ave. at grade and continued southward over a low-level, three-span concrete arch bridge spanning the Tidal Basin outlet. Traffic was often dammed up at Maine Ave., resulting in intermittent congestion over the 14th St. Bridge. Now 14th St. traffic is carried in a uniform flow over Maine Ave., the Tidal Basin outlet, and the Hains Point exit on two 34-ft. roadways separated by a 4-ft. median strip. Maine Ave. is reached from the new structure by means of a ramp, and plans provide for a future ramp to allow access to the structures from Maine Ave.

Five bridges in close proximity

The central feature of the 14th St. work is a new high-level bridge built upon the foundations of the former low-level bridge across the outlet (Fig. 2). There are now five bridges in close proximity across the outlet at this point. They are: The new high-level bridge, a recently constructed low-level bridge carrying 15th St. traffic over the outlet, a low bridge containing the outlet gates with which the level of the basin is controlled, a new ramp bridge leading down to Maine Ave., and a steel truss bridge carrying two tracks of the Pennsylvania R. R. Because of this multiplicity of crossings, archi-



g. 2. Through traffic on 14th St. is carried over the Tidal Basin outlet on a light, high-level, three-span, reinforced oncrete, rib-type structure masked with stone-faced curtain walls.

cture dictated that the new high-vel bridge should be of simple lay-ut with stone walls carried as low as ssible.

It was therefore decided to build pon the existing piers a light rein-rced-concrete, rib-type structure of ree 56-ft. rigid-frame spans, masked y stone-faced curtain walls having w, flat arches. The old piers rest on mber piles carried to gravel and ck. When the weight of the former lled roadway was removed, the ca-acity of these piles was adequate to pport the new bridge.

The new ramp bridge immediately o the east of this crossing consists of ontinuous, reinforced-concrete, T-eams having spans of 67, 56 and 67 t. It is supported on new concrete oundation built as extensions from he main bridge piers. Fluted con-rete-filled steel piles carried to the ravel and rock stratum at about El. —90 were considered best where new oundations had to be built. These piles are designed to carry loads of 5 tons each under dead load and 37 ons under dead-plus-live load. They verage 82 ft. in length.

At Maine Ave. and at Hains Point Exit, the new overpass structures are skewed, reinforced - concrete, stone-faced, two-span, barrel-type rigid frames (Fig. 3). The clear square span of the Maine Ave. rigid frames is 43 ft., and that of the Hains Point exist overpass 45.5 ft. Because the piers are pile-supported, ties of reinforced concrete are used across the spans in the plane of the footings.

Approaching and connecting these principal structures are long lengths of continuous, reinforced-concrete T-bean stringers supported on transverse, rigid-frame floorbeams, all contained within curtain walls (Fig. 4). The approaches are generally in groups of three spans of about 25 ft., so that expansion occurs in both the curtain walls and roadway at intervals of about 75 ft.

Median strip divides deck

All of the new 14th St. structures are designed for a 20-ton truck loading on the inside lanes near the median strip, and 35-ton loads on 10-ton trailers on the outside lanes. To provide for transverse expansion in the roadway, the two halves of the deck are separated with a 4-ft. wide slab serving as the median strip. The expansion ends of the T-beam stringers are mounted on cast iron shoes with bronze inserts, which is expected to eliminate corrosion. Screened vents are provided in the curtain walls of the cellular construction adjoining the expansion points and the interior of the cellular construction is accessible by metal doors in the backwalls of the overpasses.

The structures are attractively faced with random coursed granite rubble and limestone trim. Because it was anticipated that shipments of stone might be at times delayed, provision was made for the placement of the curtain walls outside the cellular construction after the roadway had been built. This provision materially aided the contractor. It was accomplished by the use of dowels projecting from the end column supports of the rigid-frame floorbeams, which permitted the walls to be tied to the columns at a later date.

Speed up of traffic results

Relief afforded traffic by the new 14th St. bridges is pronounced. During a normal 24-hr. average week day in 1941, a total of 54,129 vehicles (excluding street-cars) passed through the intersection of 14th St. and Maine Ave. Over one-fourth of this traffic made some turning movement, and during the peak-hour periods a minimum time of 3 min. per vehicle was required to negotiate the intersection. With the grade separa-

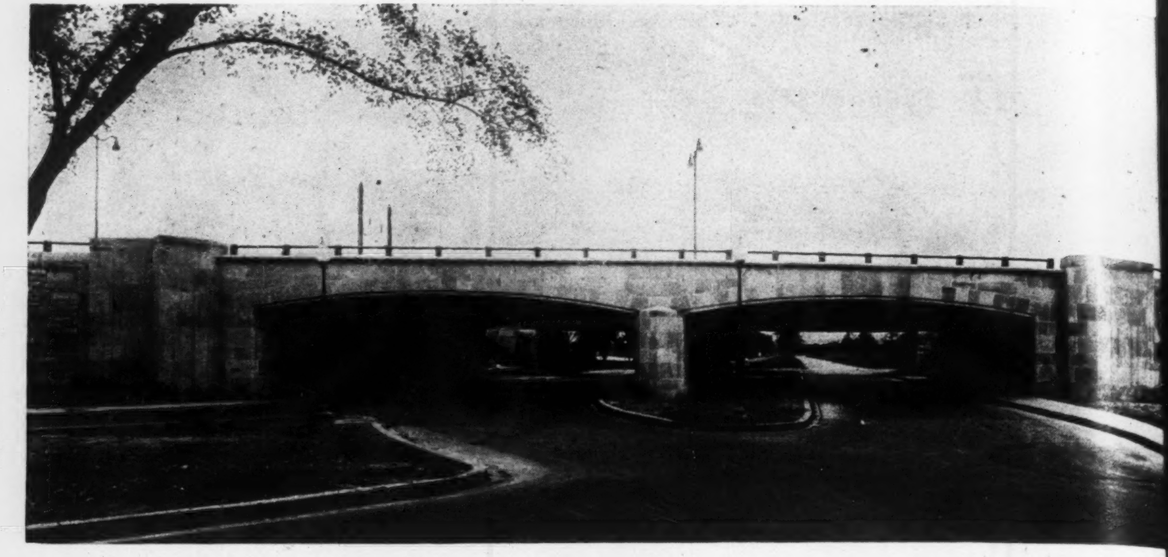


Fig. 3. To carry 14th St. over the Hains Point exit a reinforced-concrete, stone-faced, double-barrel rigid frame was buil **These skewed spans each have 45.5 ft. square clear opening. Wide deck of bridge provides two 34-ft. roadways.**

tion in place, it is now possible to cross the former congested area in 10 sec. or less. It is estimated that this speed-up indicates a time saving of at least 30,500 car-minutes per day, representing a tremendous saving of gasoline to the motorist and commercial vehicle operators.

Considerable relief also is provided on Pennsylvania and Constitution avenues by the structures that extend Independence Ave. across and around the north end of the Tidal Basin to serve the Arlington Memorial Bridge. Throughout the extent of this project, two 34-ft. roadways are now provided along Independence Ave. One road, carrying eastbound traffic, cuts across the Tidal Basin, and the other, carrying westbound traffic, skirts the north end of the basin behind a newly constructed monumental seawall following a new shore line.

The new bridge across the basin (Fig. 5) is designed for the District of Columbia 15-ton truck loading. It consists of five groups of continuous steel beams of three 40-ft. spans and cellular abutments, having an overall length of about 800 ft. The superstructure of the main spans is an asphalt-surfaced, reinforced-concrete slab on wide-flange, rolled beams made continuous, the outermost beams being encased in concrete to give the appearance of masonry co struction. The short approaches ar of cellular construction, consisting o a continuous, reinforced-concrete T beam roadway supported on cros walls, and enclosed within curtai walls faced with granite rubble an limestone trim.

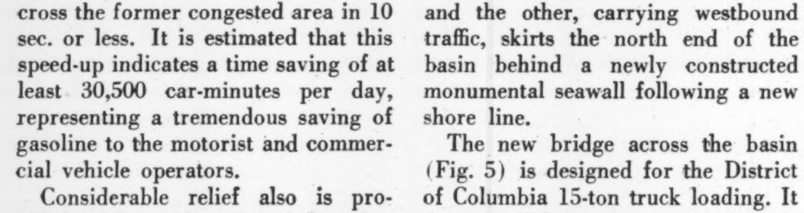


Fig. 4. Principal grade-separation structures over 14th St. are connected by cellular construction consisting of continuous tee beams supported on rigid-frame, transverse concrete floorbeams, all contained within curtain walls. Because delivery of material was uncertain, provision was made for addition of stone facing after concrete work had been completed.

Bridge supported on timber piles

At the location of the new bridg the bed of the basin is muck startin about 10 ft. below water level an extending to soft rock about 35 f below water level. In order to avoi deep cofferdams carried to rock, th foundations for the bridge were de signed of timber piles driven throug the muck to bearing on the roc stratum, and supporting footings a an elevation of 3 ft. below the wate surface. The piles were loaded to 1 tons each under dead-plus-live load (During construction test piles were loaded to 35 tons without failure) Support of the piers at the high leve added to their lightness and reduced the number of piles required.

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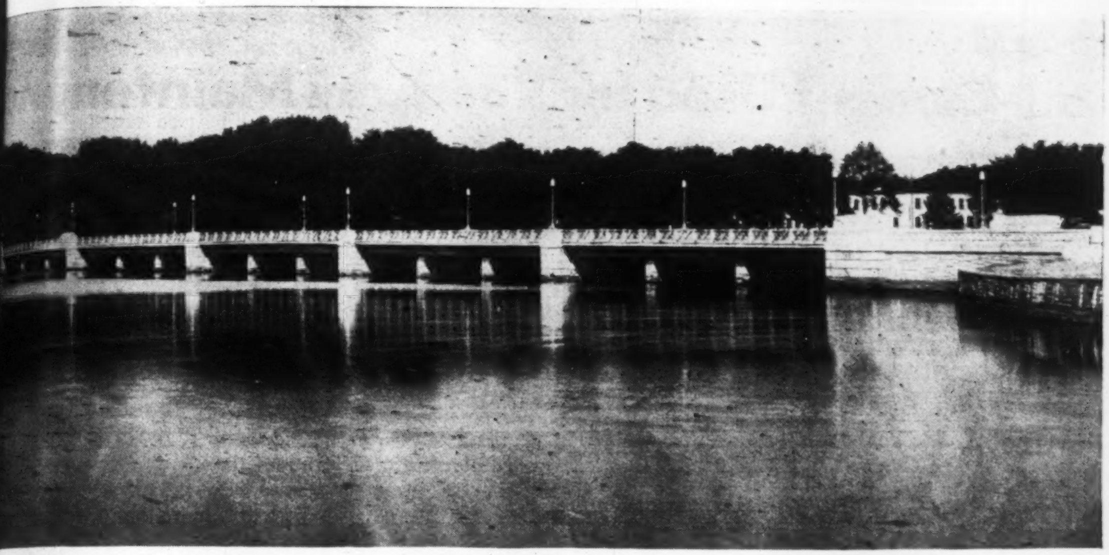

. 5. Eastbound traffic on Independence Ave. is carried across Tidal Basin by five groups of three 40-ft. continuous steel-m spans. Outer beams were encased in concrete for better appearance of finished structure.

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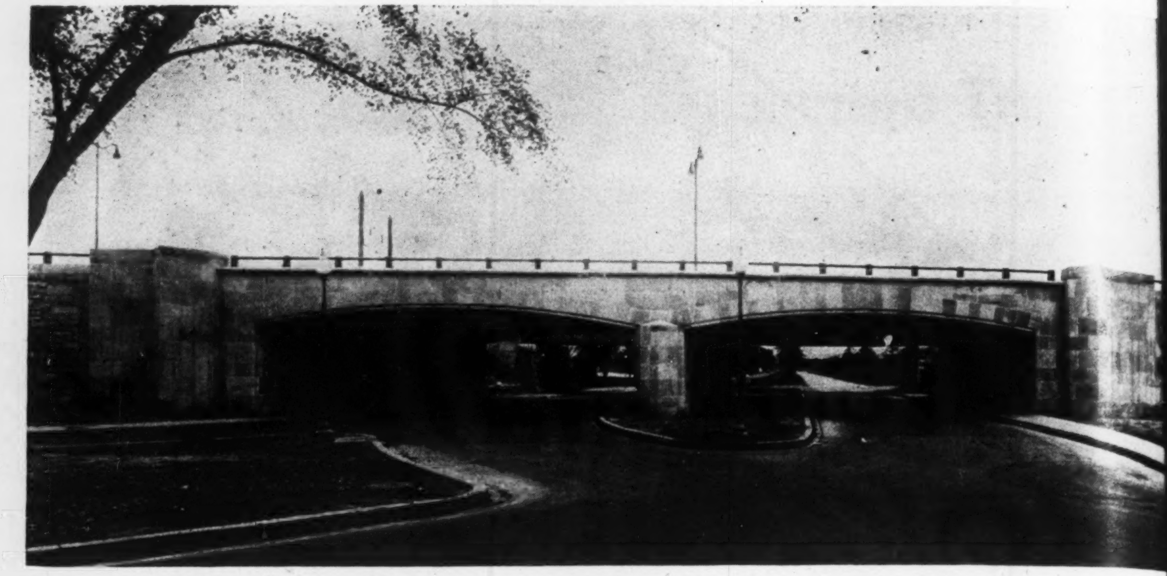
Fig. 6. New overpass on Independence Ave. is a skewed, reinforced-concrete, rigid frame of 36-ft. square clear span. Struts between pile-supported footings were designed to act as ties.



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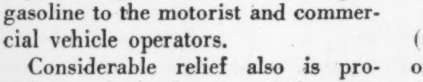

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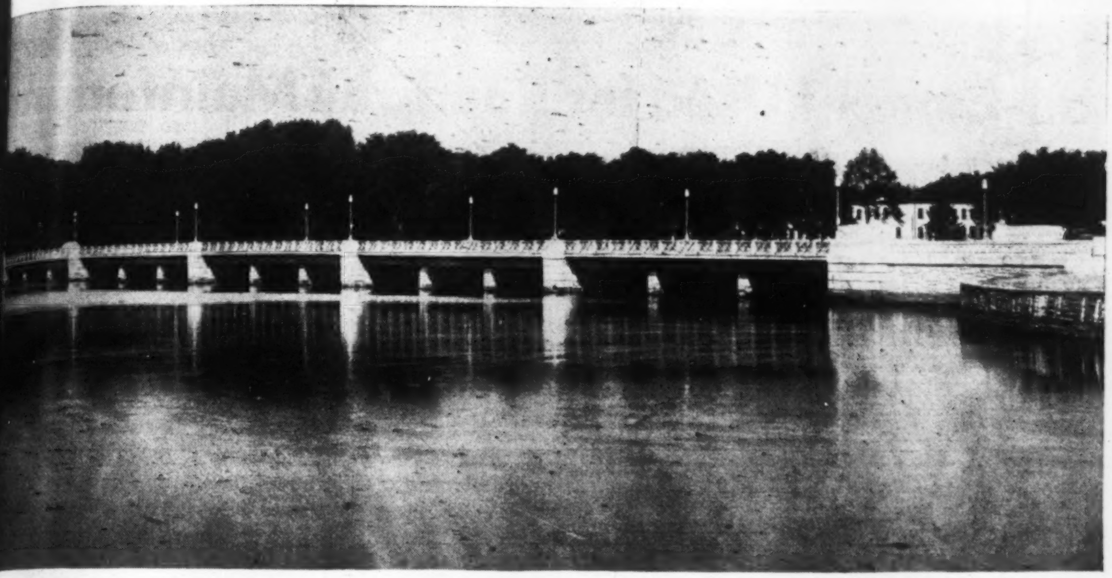

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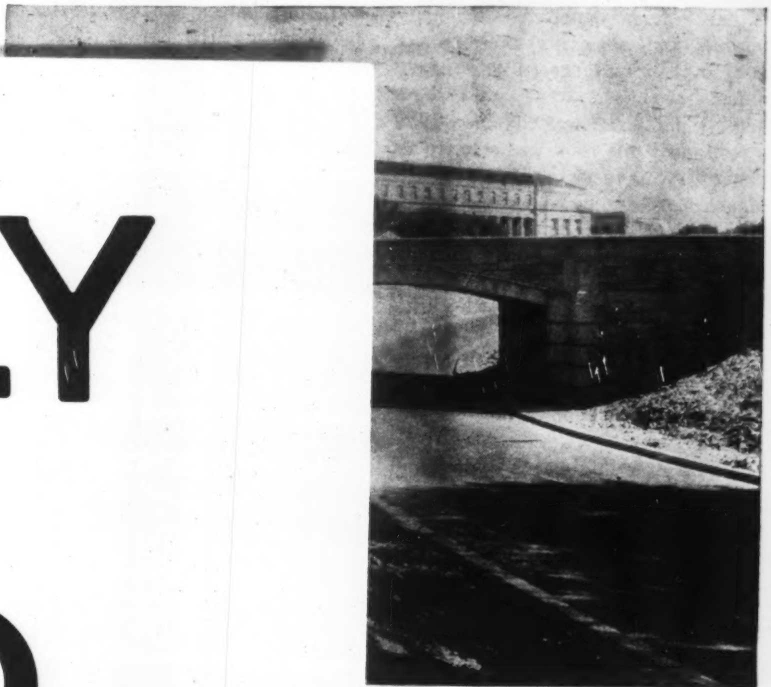

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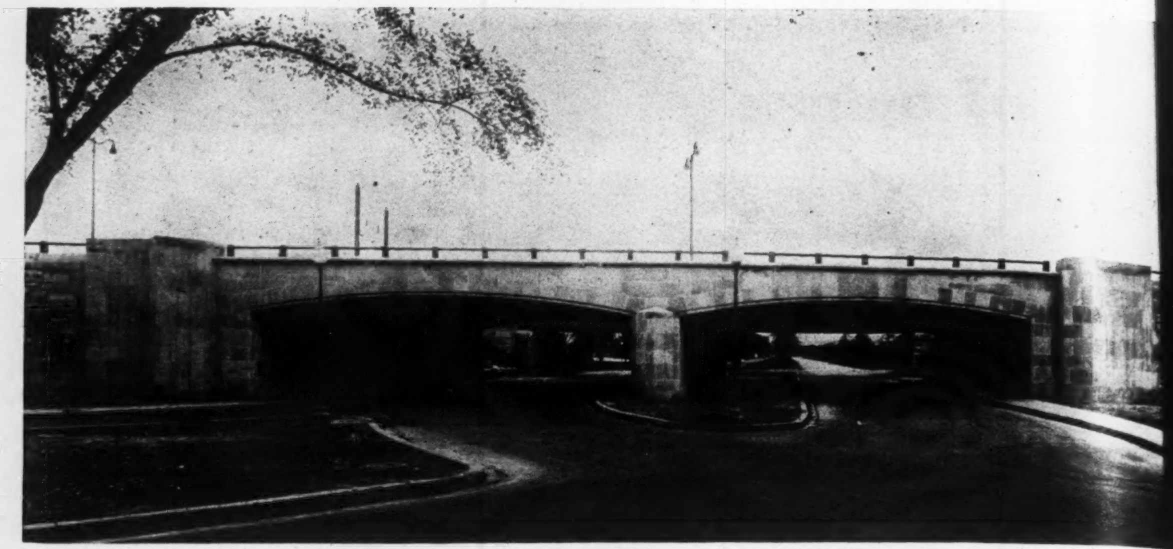

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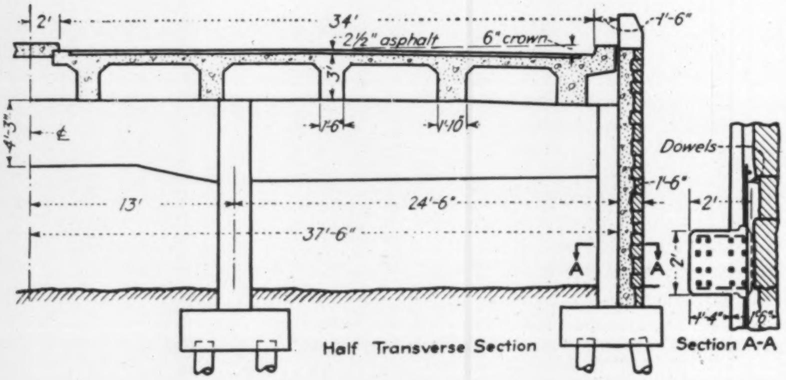

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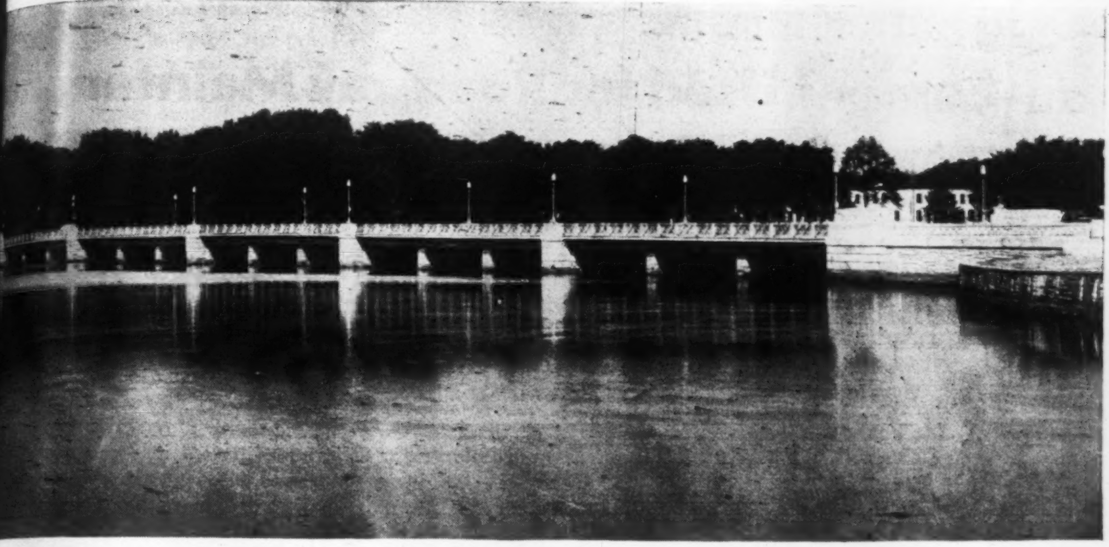

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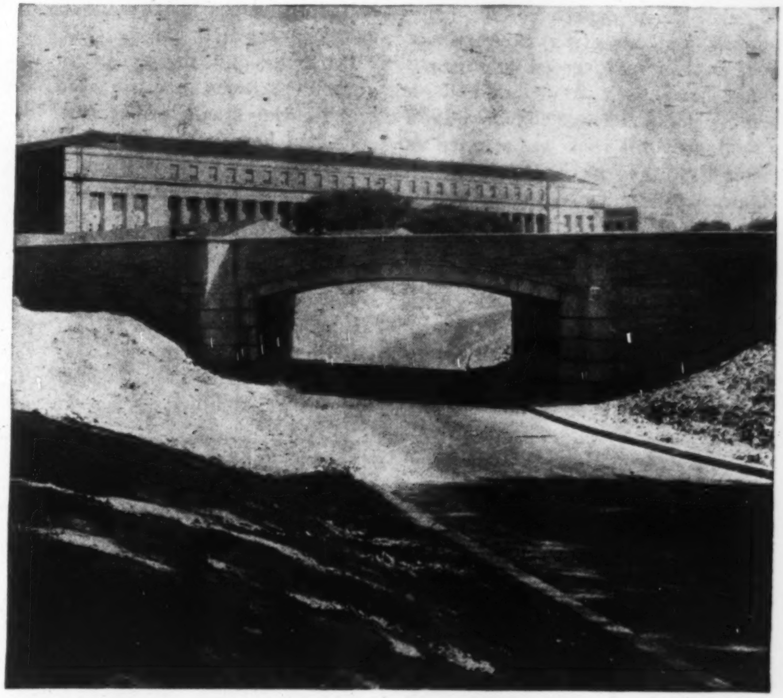

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Soil-Cement Used for Roadway Maintenanc

L. E. Akers
Assistant Maintenance Engineer, Virginia Department of Highways
Richmond, Va.

Contents in Brief*—In patching secondary roads with soil cement the Virginia Department of Highways removes the broken pavement, plus any underlying unstable soil, and fills the excavation with about a 10-in. thickness of soil-cement placed over crushed stone. The soil-cement mix is compacted in place in roughly 4-in. layers with pneumatic tampers and the last layer is covered with a 1-in. sand-asphalt wearing surface. The patched areas are opened at once to traffic.*

CONSIDERABLE QUANTITIES of soil-cement is now being used by the Virginia Department of Highways for patch work in maintenance of secondary roads. Some roads designed for a normal traffic of 600 to 1,000 vehicles daily have been subjected to traffic movements ranging from 3,000 to 11,000 vehicles per day, consisting mostly of heavily loaded trucks. As a result, the maintenance problem has increased greatly.

Use of soil-cement for patch work is based upon experience in maintaining and repairing State Route 168, over which exceedingly heavy loads have been transported to a densely populated war zone. In 1939 a section of this road was selected as a stabilization experiment and lengths of about two miles each were stabilized with various materials, including emulsion, tar, cut-back asphalt and portland cement. These experimental sections were surfaced with a light bituminous treatment. Under light traffic these sections held up satisfactorily, but soon began to show signs of deterioration as heavy trucking increased.

Upon examination, it was found that the failures were largely on the side used by loaded trucks traveling toward the war zone, and were the result of local instability immediately below the 6-in. stabilized paving. Repairs were made by excavating to a depth necessary to remove all excessively wet and spongey sub-soil. The soil in most cases proved to have a high clay content, definitely unstable when very wet. After removing this objectionable material, the opening was filled with crushed stone, pit-run clay gravel, and in some cases with a sand-clay mixture.

Shortly thereafter it became apparent that roads repaired in this manner required still further treatment. The crushed stone and gravel whipped or shifted out under heavy traffic and it was evident that this method gave only temporary relief. Some method of durable repair was considered necessary. The method had to be rapid, economical and such that the repaired areas could be immediately opened to traffic.

During the past three years the Virginia department had surfaced several roadways with soil-cement. Results had been generally satisfactory for roads carrying medium traffic, and a decision was reached to repair deteriorated areas on Route 168 with such a mixture.

A good sand-clay pit nearby was selected and soil samples were tested in the laboratory of the department. Addition of twelve percent of cement by volume was found to be ample for the desired stability. When the soil
was mixed with this amount and c
pacted with a moisture content
nine percent, a dry weight of 120
per cu. ft. was obtained. The exp
mental work also showed that patc
made with a mixture containing
more than nine percent of w
could be opened immediately to t
fic, and if more than nine percent
used, the patches would be damag
somewhat by heavy traffic, making
necessary to keep traffic off
patches a few days.

LABOR AND EQUIPMENT USED ON REPAIR WORK

1—Air compressor with attachments for tamping
1—Portable two-bag concrete mixer
1—5-ton smooth wheel steel roller
3—Dump trucks of 3-yd. capacity
10—Laborers for excavation and other work on the road
5—Laborers at the pit
3—Truck drivers
1—Roller operator
1—Compressor operator
1—Concrete mixer operator
1—Foreman
1—Laboratory inspector

Materials mixed at borrow pit

The soil selected could have b
mixed with either paddle type mix
or concrete mixers, although so
soils require paddle mixers. A t
bag concrete mixer was available, a
it was set up at the pit. The soil
measured in wheelbarrows a
dumped directly into the hopper
the mixer, along with the requi
amount of cement. Sufficient wa
was added to establish proper c
sistency. The mixing operations w
supervised by a representative fr
the department's Richmond labo
tory.

On the highway, a work crew
cavated the areas of failure to
depth of from 2 to 3 ft. All the edg
around the excavation were squa
off neatly, and care was exercised
see that the excavation was ma
slightly beyond the limits of failu
All objectionable, unstable subs
was removed. Crushed stone ba
fill was added by shovel and co
pacted with pneumatic tampers. T
stone was added to within 8 or 10
of final grade.

The soil-cement mixture was
livered by truck and dumped i
mediately into the excavation. T
mix was spread evenly with shove
and compacted with the pneuma
tampers in layers about 4-in. thic
The surface of each layer was roug
ened slightly before addition of t
next, in order to insure proper bo
between successive layers.

After compacting the final layer, surface was smoothed by rake d shovel and compacted with a on roller. In some instances this al operation was carried out with ruck. The number of laborers re-ired on this job and the equipment d is listed in an accompanying le.

Barricades were removed after the mpletion of each patch and the adway was opened to traffic. No mage to the patches was apparent. ter a few days, the soil-cement tches were given a light tar-and-d seal coat. Eventually it will be essary to give all the patches a facing comparable to that on the mainder of the road

Methods used on other roads

Due to the excellent results of this rk, several small areas on nearby ads were repaired in a similar man-r. Of these, U. S. Route 60 is one the principal highways leading m Richmond to Newport News and Hampton Roads area. The road-y on this route consists of a 1-in. d-asphalt surface on an 8-6-8-in. ncrete base constructed about 18 ars ago over an inferior subsoil. affic is much heavier on Route 60 n on Route 168. On roads like s one where the traffic count is avy and where the pavement is of high type, repairs of this nature ve proved to be an excellent ex-dient in this emergency.

At points of failure on Route 60 cavation was made 14 in. below ade and the edges were squared up before. Holes were filled to within in. of the top by addition of three yers of the soil-cement compacted place with pneumatic equipment. e surface, after being leveled off hand, was rolled by truck.

These patches also were exposed to affic immediately after completion th no apparent harm to the soil-ment. After two days, the surface each patch was cleaned of loose aterial, the edges squared, and a in. sand asphalt wearing surface as added as the last operation.

A total of about 1,500 sq. yd. of vement has been replaced in Vir-nia by addition of soil-cement atches, the size of patches varying om 2 by 3 ft. to about 11 by 15 ft. ome of the patches have now been use under heavy traffic for over ghteen months. With a few exceptions, they are proving satisfactory.

At present, further repair work of this nature is planned by the Virginia department for other roadways showing similar destruction. On small patch work the procedure described will be used. Where long stretches have to be torn up, mixed-in-place construction will be followed.

Soil-cement mixture is delivered by truck and compacted in place with pneumatic tampers. Repaired areas are opened immediately to traffic. Sand-asphalt wearing surface will be added later to patch shown in bottom photograph.

Water Supply for an Island City

***Contents in Brief**—Construction to provide an auxiliary water supply for Newport, R. I., included: A low concrete dam across a tidal pond to create a 400-mg. reservoir, an earth dam at a second location to make available equal storage, a 4-mile pipeline, a 4-mgd. treatment plant, and a 4,000,000-gal. plain concrete reservoir for filtered water storage. An outstanding feature of the work were the measures eliminating salt in the tidal pond.*

Construction recently completed at Newport, R. I., to meet increasing water demands is of interest because of the procedure followed to develop additional sources and the manner in which old and new supplies were combined to permit a wide range of operating conditions. The building methods employed to cope with shortages of reinforcing and structural steel as well as other critical materials add further interest to the project.

Newport, R. I., a city of 32,000 population before the war, is situated on the island of Aquidneck, which is surrounded by the Atlantic Ocean, Narragansett Bay, the Sakonnet River and the Taunton River. Long famous as a summer resort, Newport's only sizeable industry was the Naval Torpedo Station, where all of the torpedoes originally used by the Navy were made. This industry, plus other military establishments, had, for many years, placed Newport in the front rank of military importance.

On many occasions in the past, the demand for water had approached the safe yield of the watershed. It had been demonstrated conclusively that there was no factor of safety and that any increased demand would create a critical condition. Several studies had been made during the past 35 years looking to the development of additional supply and storage facilities, but nothing definite had been done until 1941, when government officials, anticipating another war with the attendant expansion of the Naval facilities, commissioned the firm of Charles A. Maguire & Associates of Providence, R. I., to make a study of all possibilities of increasing the city's supply.

Surface runoff used in past

The existing system consisted of six storage reservoirs on Aquidneck Island, having a total capacity of 1½ billion gallons (Fig. 1). These impounded the flow of all important streams on the island, with the ception of the Lawton's Valley bro in the town of Portsmouth. T watersheds produce relatively so highly colored water typical of sou ern New England.

Water from five of the reservo was conveyed to the sixth res voir by means of open ditch gravity lines and force mains. He was located the treatment plant bu in 1876 by George H. Norman, o of the pioneers in water filtrati and treatment. Several differ types of filters and methods of treatment were used until 19 when a rapid mechanical filter pla of 6-mgd. capacity with 4-hr. dete tion was built.

As time went on other faciliti were added to provide for treati the water with pre- and post-chlo ination, lime, alum, ammonia, ac vated carbon and sodium-hexamet phosphate. Filtered water stora facilities were enlarged to include 100,000-gal. clearwell and an 8-m equalizing reservoir.

Studies showed that surface su plies on Aquidneck Island, which h an area of 45 sq. mi., were not suf cient for the anticipated demand, u less more storage was provided small reliance could be placed o wells because the underlying geolog cal formations, practically all shal were not conducive to groundwate production. This same geologic formation caused a rapid surfac run-off. Further study showed would be impossible to obtain addi tional supplies from adjoining citie within the allowable time, becaus of Newport's location and the dis tances involved.

Investigation of all possible source of supply lead to the conclusion tha the permanent solution, if a safe yiel of 7½mgd. was to be provided, wa construction of a 40-mg. reservoir a Lawton's Valley with a watershed o 1.1 sq. mi. This storage could b provided by means of a low dam o Lawton's Brook. A modern treat ment plant at that point was also recommended.

Early in 1942, due to a period o

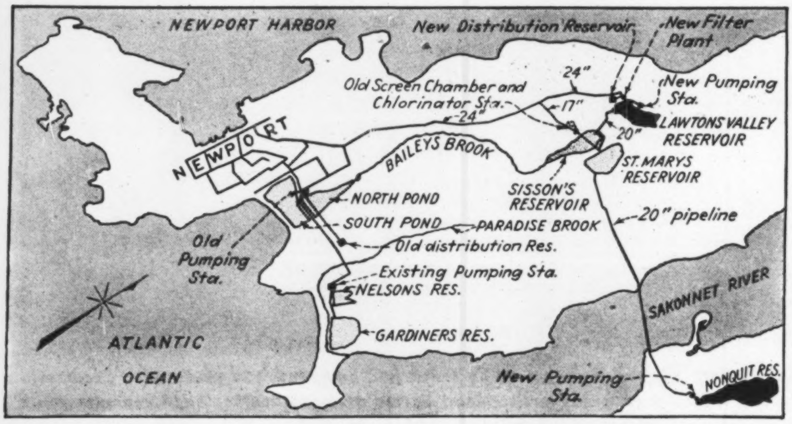


Fig. 1. To supplement the existing water supply for Newport, which included six reservoirs providing 1½ billion gal. storage, two new reservoirs each of 400-mg. capacity were constructed. One is on Lawton Valley Brook on Aquidneck Island, and one in Nonquit Pond, a tidal pond on the mainland. Other new construction included a 20-in. sub-aqueous pipeline connecting the Nonquit Pond storage with existing facilities, a 4-mgd. treatment plant, and a 4-mg. clearwater reservoir.

low rainfall and the enormous expansion of naval requirements, the situation became critical. It was evident that the Lawton Valley project could not be completed in time to impound water until after the spring rains of 1944.

To meet this immediate need two other projects were developed. These were:

1. Increasing the capacity of existing Gardiner's Reservoir from 250 to 400 mg. by raising the height of the earth embankment from El. 15.0 to El. 21.0.
2. Development of Nonquit Pond, a small tidal inlet in Tiverton, R. I. on the mainland with a drainage area of 6 sq. mi., which is practically equal to the watershed of the six existing reservoirs. This work included construction of a pumping station and a 4-mi. pipeline to transport this water to the existing system.

With the full cooperation of the Navy Department, the Federal Works Agency and the city of Newport, approval of these projects along with the Lawton Valley work was obtained and funds were made available for the new construction by the Federal Works Agency. Work was started in August, 1942.

It was planned that: (1) The increased capacity of Gardiner's Reservoir would impound the excess runoff from Paradise Brook during the spring of 1943; (2) the development of Nonquit Pond would meet the anticipated demand during the summer of 1943 and the winter of 1943–44; and (3) the Lawton's Valley project would then come into operation to provide the 7½ mgd. required to meet all anticipated demands.

The wisdom of this multiple plan was demonstrated in September, 1943, when the existing reservoirs had reached an all-time low due to the lowest rainfall in 45 years (28 in. as against an average of 42 in), and the demand rose to 6¼ mgd. At that time the Nonquit Pond project came into full operation, and so augmented the supply as to make it unnecessary to restrict water use.

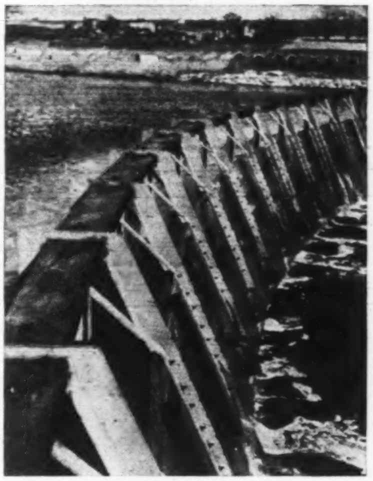


Fig. 2. *Low ogee dam creating Nonquit Pond reservoir is equipped with tidal gates to prevent unusually high ocean tides from spilling over the dam into the reservoir.*

The Lawton's Valley reservoir is now complete and impounds considerable water. Also, the new 4-mgd. treatment plant with its 4-mg. clearwater reservoir is in operation. It treats water from the new Lawton's Valley Reservoir and the old reservoirs, known as St. Mary's and Sisson's Pond, water from the new plant being delivered to the city through a new 24-in. pipeline. The latter, which is 4 miles long, connects the new system with the old. The new plant relieves the load on the original treatment plant, which has been operating at near capacity for two years with no opportunity for major repairs.

Salt in water a problem

Relation of the new facilities to each other and their construction can best be described by starting with the Nonquit Pond. This plain concrete ogee-type structure is about 100 ft. long and has a height of 7 ft. above mean low water. It provides a total storage capacity of 562 million gal. of which 400 million is termed "usable."

Previous studies had shown that the salt content of the pond at times totalled 5,000 ppm. Since the water initially impounded by the dam could be expected to contain a high percentage of salt, a problem arose as to the best method to reduce the salt content of this supply before it was tied into the existing system.

The problem was solved by pumping from behind the dam as soon as the timber bulkheads between which the ogee structure was built were in place. Water was wasted for a period of three months with the flow averaging 10 mgd. At the end of this time the salt content in the water had dropped to 125 ppm., or sufficiently low that its presence, after further reduction by dilution in St. Mary's, Sisson's and the other old reservoirs, created no taste problem. The tide gates installed above the dam to permit outward flow and to prevent unusually high tides topping the dam are shown by Fig. 2.

To deliver the water from Nonquit Reservoir to the new treatment plant a 20-in. dia. pipeline about 4 mi. long and a small brick pump house equipped with one 3-mgd. electrically driven centrifugal pump was constructed. Later a similar 2-mgd. unit was installed. The pipeline, which

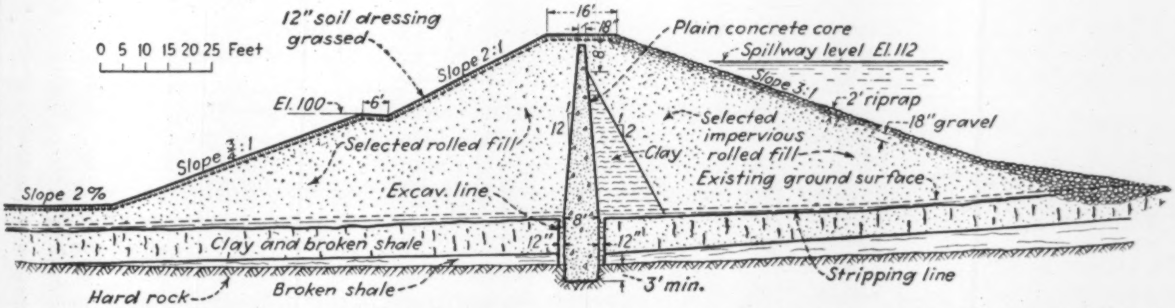


Fig. 3. *A 2,600-ft. earthfill dam of the above general cross-section and of about 40 ft. max. height was constructed to provide 400-mg. reservoir on Lawton Valley Creek. Because of the reinforcing steel shortage, the core wall was built of plain concrete, which resulted in a wall 8 ft. thick at the base.*

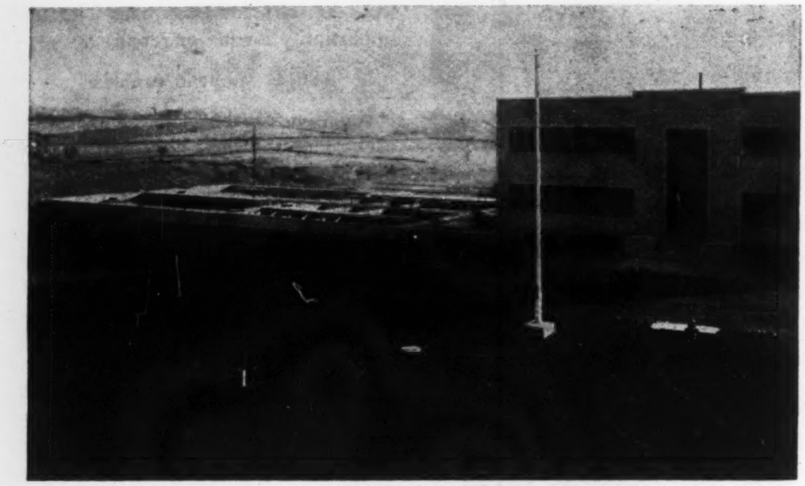


Fig. 4. Coagulation and sedimentation basins of the new 4-mgd. treatment plant (at left) were built of plain concrete. The two-story building with brick walls housing the pumping equipment, chemical feed machines and filters has timber floors and interior framework.

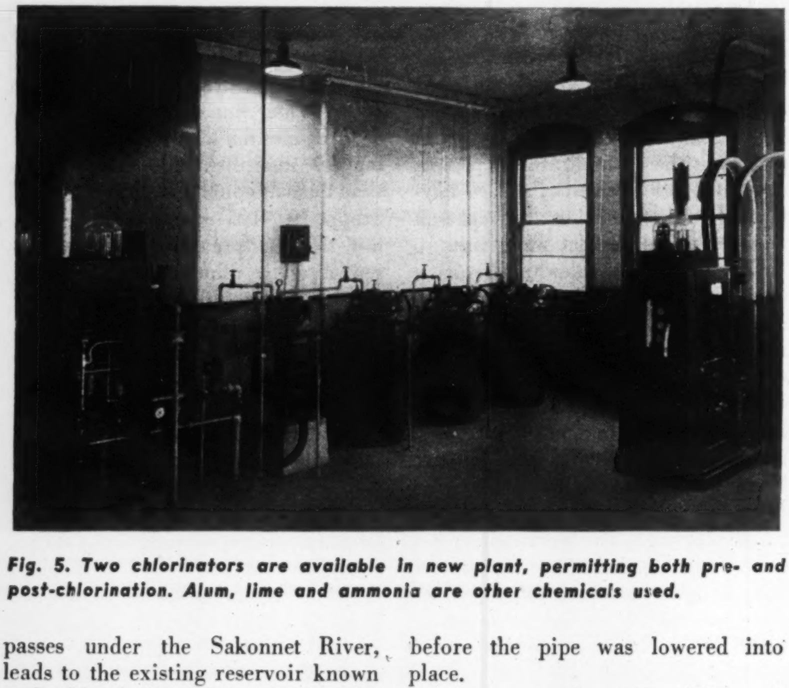


Fig. 5. Two chlorinators are available in new plant, permitting both pre- and post-chlorination. Alum, lime and ammonia are other chemicals used.

passes under the Sakonnet River, leads to the existing reservoir known at St. Mary's (Fig. 1) and on to the new treatment plant. By making this type of connection, water could be delivered from St. Mary's reservoir to the old facilities or it could be diverted to the new treatment plant.

This main supply line under the river is of cast iron with metropolitan-type joints. The sections of pipe for the river crossing were laid with a cradle swung from a barge with its lower end sliding along in a dredged trench in the river bottom, the joints being sealed with lead above water before the pipe was lowered into place.

Storage at Lawton's Valley is created by an earthfill dam of about 40 ft. maximum height and 2,600 ft. long. An unusual feature of the dam is the non-reinforced cut-off wall along the axis of the structure. Because of the lack of reinforcing steel the wall, which has a top width of 18 in., had to be made 8 ft. thick at the base (Fig. 3).

Water stored in the Lawton Valley Reservoir is pumped to the new treatment plant nearby, which has a capacity of 4 mgd. with a 4-hr. detention. Treatment consists of pre-chlorination followed by the use of alum, lime, and finally ammonia and rapid-sand filtration and post-chlorination. This type of treatment was selected since similar methods had proven entirely satisfactory at the old plant. The only major change was the use of up-flow coagulation units.

Construction of the plant is of special interest because of the skillful use of available materials in building a plant that is expected to have a long life with low maintenance costs. Two 27x46-ft. coagulation basins of the up-flow sludge blanket (Permutit) type are used. The coagulation basins are uncommon in that the outer walls are of plain concrete and the interior partitions of timber construction. This design called for walls as thick as 8 ft.

The retention basins, which measure about 30 by 80 ft. in plan, by 25 ft. in depth, also have plain concrete walls, some equally thick. In constructing both basins great care was exercised to avoid leakage. The footings for the walls were carried to rock to prevent settlement. To eliminate cracks due to shrinkage of the large concrete masses involved, the walls were poured in alternate sections with allowance for major shrinkage to occur before the closing sections were built. Water-stops were used at all joints.

Filters have concrete troughs

Four rapid sand filters each measuring 18x27 ft. in plan (Fig. 7) and designed to filter 2 gal. per sq. ft. per min. are provided. The filters also are characterized by plain concrete walls, some as thick as 7 ft. at the base, and by washwater troughs of reinforced-concrete. Although timber troughs were considered, the concrete construction was finally adopted and the troughs were so designed as to use a minimum amount of reinforcing steel.

Because automatic operating equipment could not be obtained, the flow through the filters is regulated by hand-operated gates.

Construction of the two-story-with-basement building to enclose the filters and to house the pumping and chemical-feed equipment was characterized by the difficulty of getting many ordinary building materials. The foundations, which rest on rock, and the basement floor and walls are of plain concrete; the upper walls re of glass brick and clay brick, and he interior frame, the first and econd floors and the roof are of imber construction (Fig. 4).

This design led naturally into exremely heavy construction for the lter operating floor. It consists of x14-in. joists on a 10-in. spacing overed by 2-in. tongue-and-groove looring with asphaltic tile covering. Framing of the floors above the pump oom are of similar construction.

The roof framing above the filters onsists of 8x10-in. timber columns on about a 16x26-ft. spacing supporting 10x18-in. transverse timber girders that in turn support 8x18-in. longitudinal roof beams on about an 8-ft. spacing. The roof consists of 2-in. timber planking covered by 2-in. of rigid insulation and a tar and gravel roof. For the other portions of the building the roof construction is much the same.

Deep reservoir of concrete

Near the treatment plant and at sufficient elevation to permit gravity flow to the city a 4-mgd. reservoir of plain concrete was constructed. This structure measures 143x206 ft. in plan inside and is 22 ft deep, providing for a water depth of 20 ft. The walls, which vary from 2 ft. in thickness at the top to 13 ft. at the base, are constructed on rock. They were built in alternate sections 20 ft. long. Woven fabric was used to seal the construction joints.

Also constructed on rock, the floor of the reservoir is a 9-in. maximum thickness of plain concrete. It was built in 20x20-ft. blocks, the concrete being placed in alternate diagonal rows. The keyed construction joints were equipped with reinforced fabric dams crimped at the joints.

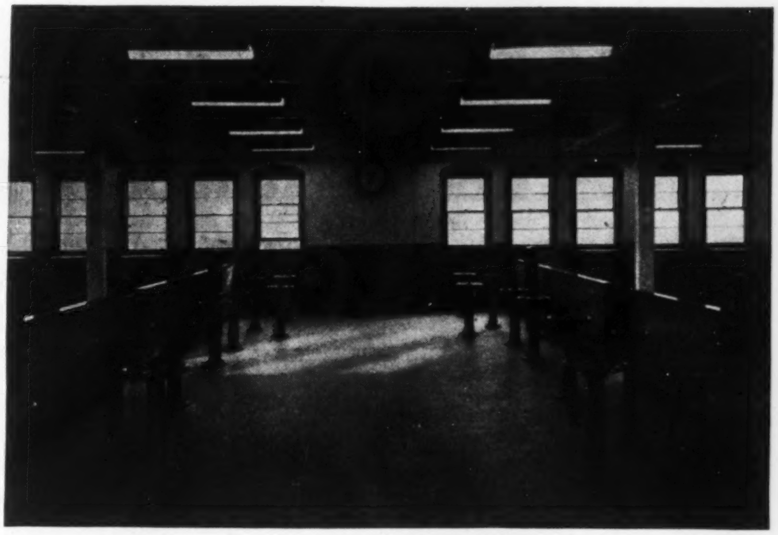


Fig. 6. Timber framework above filters consists of 8x10-in. columns, 10x18-in. roof girders, and 8x18-in. beams. Filters are hand-operated.

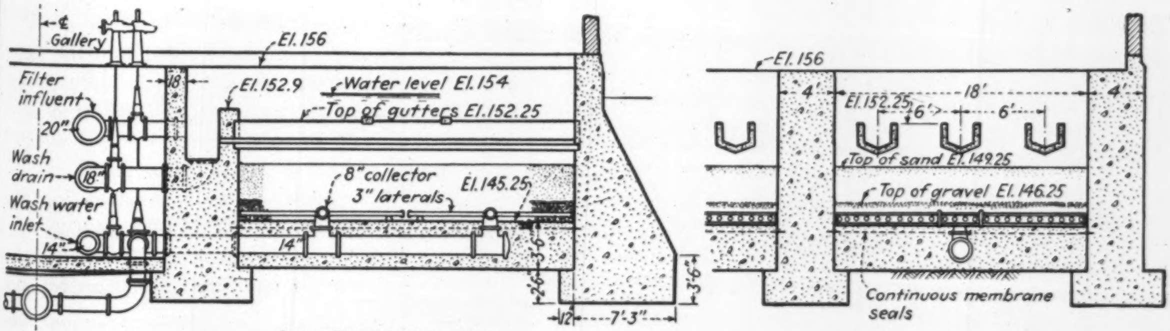
Flow from this reservoir to the city to connect with the existing distribution system is through a new 24-in. dia. main. Parts of the line were built of cast iron and the remainder of asbestos-cement pipe.

Total capacity of all the treatment facilities now available at Newport is 10 mgd. When two more filters are added it will be possible to treat 12 mgd., which is expected to meet the needs of the city for many years.

Cost of the improvements, which are now all complete, except for sodding and other work that could not be done in the winter, is estimated at $4,000,000. Most of the funds were supplied by the federal government, the work being done by the New York regional office of the Federal Works Agency, John M. Gallagher, regional director; James A. McConnell, assistant regional director; Fred L. Mulcahy, district engineer; and Robert H. Hogg, construction engineer. Harold E. Watson is waterworks commissioner for the city.

Charles A. Maguire & Associates, Providence, R. I., were the engineers for the entire development. This firm was at the same time engaged in developing plans for the increased naval facilities at Newport, R. I. and was thus in a very favorable position for co-ordinating all of this work. Elson T. Killam, hydraulic engineer, New York City, acted as consultant on the wate works project.

General contractors included: Gilbane Building Co., Providence; Bass Engineering and Construction Co., Detroit, Mich.; Rocco Zoppo, Boston, Mass.; J. P. Leaming, Wyncote, Pa.; and Callan Construction Corp., Bristol, R. I.; P. T. Cox Construction Co. and Spearin, Preston & Burrows, Inc., New York.



Longitudinal Section

Transverse Section

Fig. 7. Filter chambers were built of plain concrete, which required thick walls Timber was considered for wash troughs, but a reinforced concrete design was expected to give a longer life.

Simplified Charts for Double-Reinforced Beams

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Engineers and Constructors
Edmonton, Alberta

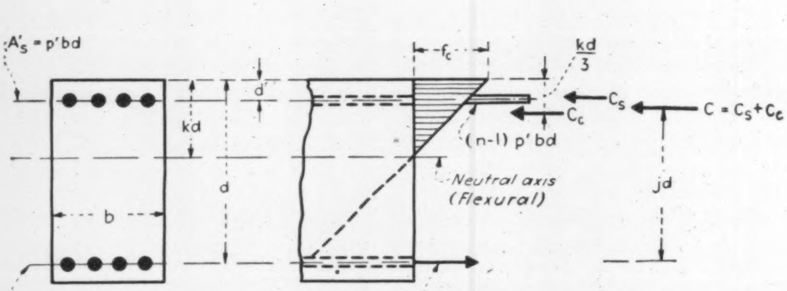
SIMPLIFIED DESIGN CHARTS adapted to suit any code may be quickly constructed for any strength concrete to speed the selection of double-reinforced concrete beams. Three charts for as many different strengths of concrete are illustrated.

The charts are based on the A.C.I. 318-41 Code using $f_c = .45f'_c$ and $f_s = 20{,}000$ psi. Since there is a definite relationship between K, p, and p' for each value of $\frac{d'}{d}$, it was possible to plot the curves for p' and $\frac{d'}{d}$ with the total K values used for abscissa and the percentage of tension steel for ordinates.

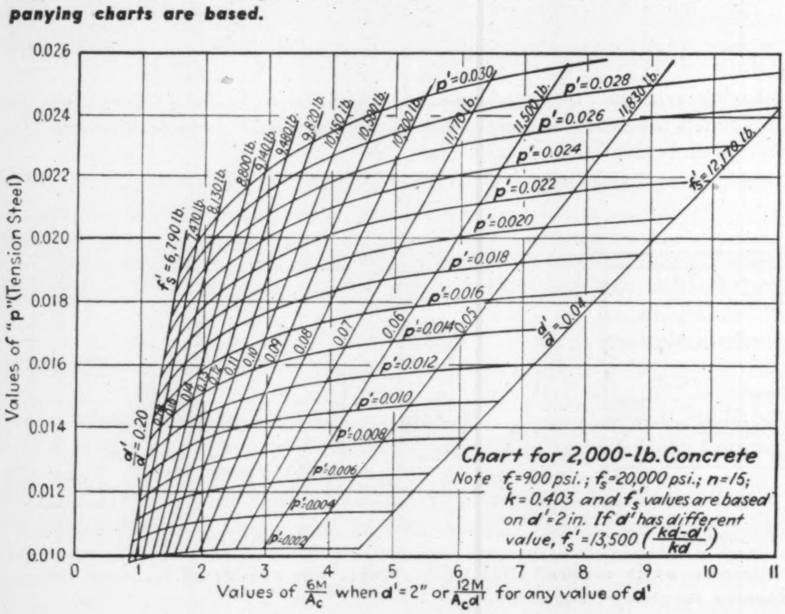
For plotting the charts, the following equations for a balanced stress design were derived. Moment of resistance equals

$$R = Tjd = Cjd \qquad (1)$$

$$\text{and } K = \frac{R}{bd^2} = \frac{Cjd}{bd^2} = \frac{(c_s + c_c)\,j}{bd} \qquad (2)$$



Transformed sectional diagram for derivation of formulas upon which the accompanying charts are based.



Total compression taken by stee equals

$$c_s = (n-1)\,p'bd\,f_c\left(\frac{kd - d'}{kd}\right) \qquad (3)$$

Total compression taken by concrete equals

$$c_c = \frac{f_c bkd}{2} \qquad (4)$$

Substituting values of c_s and c_c in Equation 2 and simplifying:

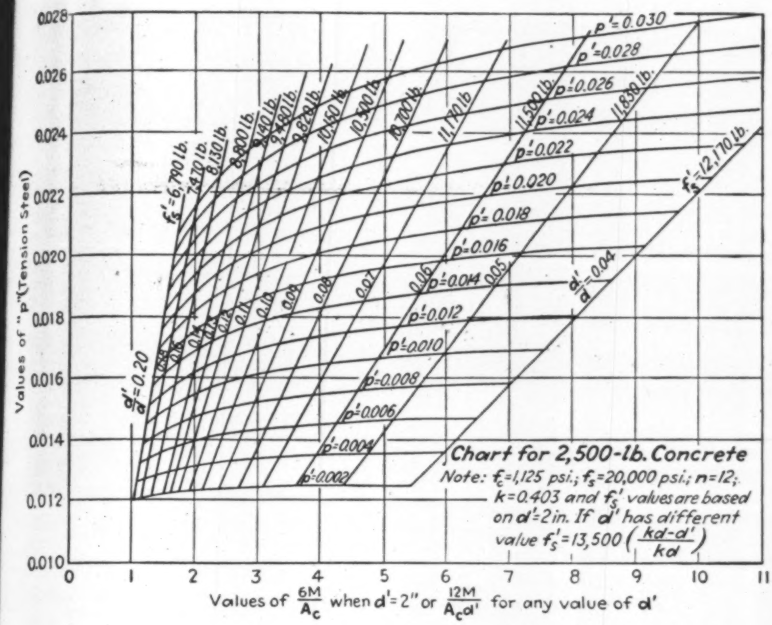
$$K = f_c\left[\frac{k}{2} - \frac{k^2}{6} + \frac{(n-1)\,p'}{k}\left(k - \frac{d'}{d}\right)\left(1 - \frac{d'}{d}\right)\right] \qquad (5)$$

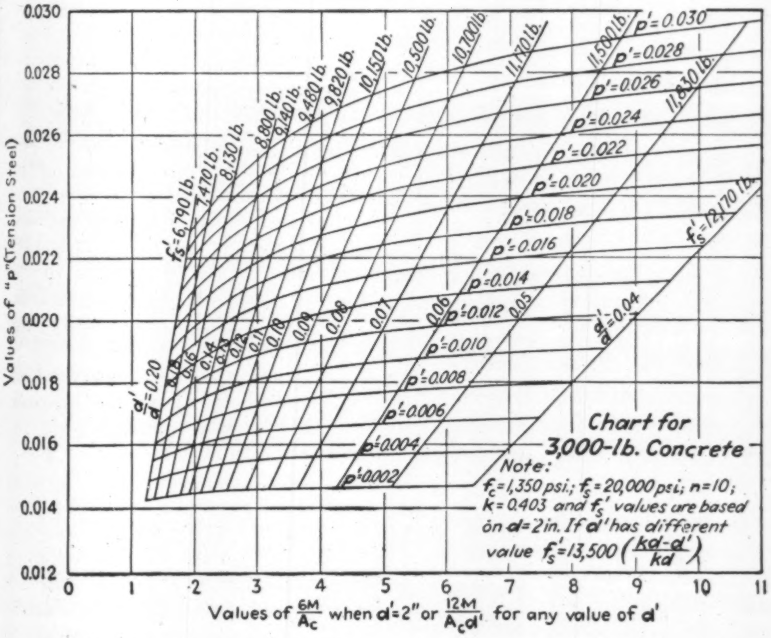
and equating $T = c_s + c_c$ and simplifying:

$$p = \frac{f_c}{f_s}\left[\frac{k}{2} + \frac{n-1}{k}\left(k - \frac{d'}{d}\right)p'\right] \qquad (6)$$

For plotting the curves, K in Equation 5 was divided by $\frac{d'}{d}$ (1,000). Since $K = \frac{R}{bd^2}$, the abscissa values were made equal to $\frac{12M}{A_c d'}$ with $A_c = bd$, where M is expressed in foot-kips. Because each $\frac{d'}{d}$ value is a straight line, computations were required for only the maximum and minimum allowable percentages of compression steel for each $\frac{d'}{d}$ value. Next straight lines were drawn between these points for each $\frac{d'}{d}$ value and each line divided into the same number of equal parts. Joining the corresponding division points on each line produced the curves for various values of p'.

Since $\frac{d'}{d}$ is a constant for any given or assumed condition, the abscissa values are in convenient terms for the designer. Also for any value of $\frac{d'}{d}$, the compression steel stresses can quickly be computed for any value of $\frac{d'}{d}$





As a typical example to illustrate use of the charts, assume the strength of the concrete is 2,000 psi.; $n = 15$; $d' = 2$ in., and moment is 150 ft.-kips. Assume also that the beam size is limited by architectural reasons to 12 × 22 in. For a solution compute the value of $\frac{d'}{d} = 0.10$ and $\frac{12M}{A_c d'} =$

$$\frac{12 \times 150}{12 \times 20 \times 2} = 3.75.$$

Next enter top chart of Fig. 2 with 3.75 for an abscissa value, proceed vertically to $\frac{d'}{d} = 0.10$ and find $p = 0.0213$, $p' = 0.0253$, and C_s, the compression steel stress, equals 10,150 psi.

If using the A.C.I. 318-41 Code, which allows the compression steel stress to be doubled with a maximum of 16,000 psi., use

$$\frac{10,150}{16,000}\, p' = 0.01605$$

for the compression steel.

Standard Building Code Requirements for Masonry

The American Standards Association has approved *Building Code Requirements for Masonry*. This new American Standard, designated ASA A41-1-1944, follows a middle-of-the-road course in its recommendations, which are believed to represent minimum requirements consistent with safety predicated upon proper design and generally acceptable workmanship, but which also permit reasonable economy and some degree of flexibility.

The standard covers in detail the materials commonly used in masonry. It relates their quality to nationally recognized specifications wherever possible, in order to give to the user of the standard the benefit of the great amount of technical work done by committees of national organizations in this field. A special section authorizes the building official to accept new materials and methods of construction upon a proper showing as to their suitability; the intent is to meet one of the chief criticisms of building codes, namely, that they retard and even discourage the introduction of new or improved materials not specifically covered by their requirements.

The new standard allows much wider latitude than many codes in the arrangement of units in masonry (bonding). A wide variety of combinations of units of different sizes and shapes is permissible, as well as different bonds in solid and hollow walls of brick. The attention given to requirements for cavity walls anticipates increasing importance of this type of construction after the war. The general requirement of many codes that brick shall be wetted before laying (no distinction being made between brick the performance of which might be improved by wetting and brick for which the reverse might be true) is superseded by setting up a simple and practical method of test to cover this point.

Although the standard does not cover reinforced masonry as such, it provides for the use of reinforcement in foundation and parapet walls as an alternate method of design.

Copies of the code may be obtained from the American Standards Association, 29 West 39th St., New York 18, N. Y. The price is 50c.

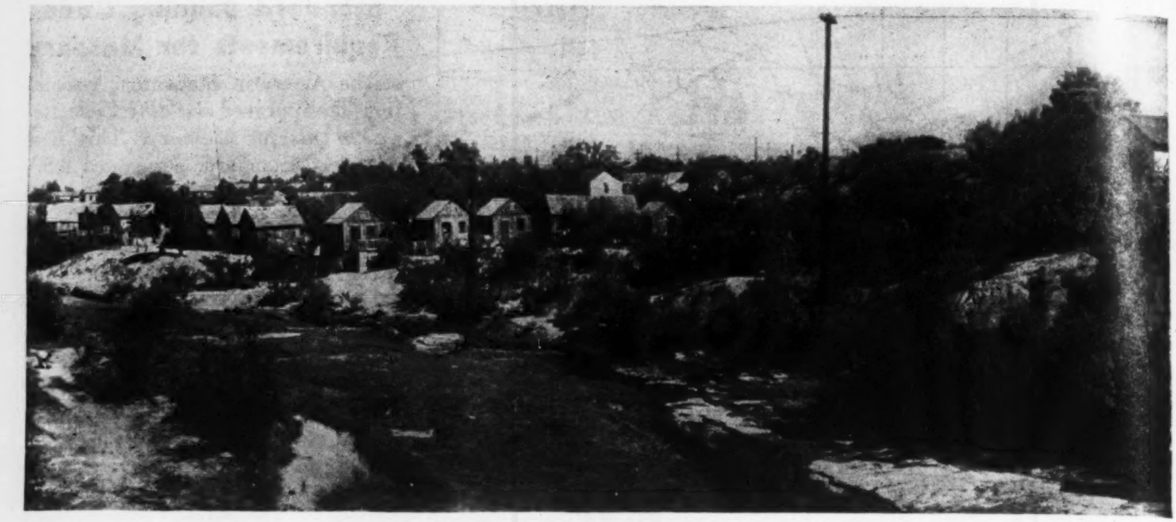


Fig. 1. Shacks in unsightly arroyo will be replaced with masonry houses amid attractive surroundings

Self-Liquidating Slum Clearance

Contents in Brief—*A Texas contractor has developed a postwar slum-clearance plan for the Mexican section of Laredo, Tex., that requires no public subsidy. More than 2,400 shacks sprawled along the banks of a dry wash in a 600-acre tract will be replaced by 2,500 modern, masonry single-family houses in a replatted area. Land ownership will be shrunk one-fourth in size to release land for parks and more building space, each lot will be traded for a new improved lot. The new homes will cost only $1650 each because of mass construction methods. Present residents can move into and purchase the new homes for $3.50 weekly, payments covering all charges under FHA insured loans. Land improvement will be financed by a half-million dollar bond issue to be retired from new taxes on the increased valuation of the district. Construction forces will be largely Laredo war veterans.*

DESPITE THE CONTENTION of housing officials, city planners, real estate operators and social workers that substandard dwellings in blighted areas cannot be replaced without a subsidy with modern, comfortable houses low enough in cost to be purchased by the original residents, a Texas highway and building contractor has come up with a simple, sound plan for self-liquidating slum clearance. H. B. Zachry, of Laredo and San Antonio, has developed a scheme for replacing 600 acres of slums in the Mexican section of Laredo with modern homes in good surroundings, to the financial benefit of all concerned, and without public subsidy.

The Zachry proposal is more than a housing plan. It involves the rehabilitation of one-fifth of the city's residential area. It eliminates an eyesore and a public health menace. And it promises postwar employment for Laredo war veterans, since it is a part of the plan that at least 80 percent of workers engaged in the construction shall be from this group of citizens.

The plan is simple. Under existing health, slum, housing and park laws, the city would condemn, by eminent domain if necessary, all property within the area except churches and an existing USHA housing project. The housing corporation (private) would then take over the property, the present owners losing one-fourth of their land. The land thus obtained will be used first for parks, second for creating new building sites to be sold and the proceeds used to pay 50 percent of the assessed valuation on improvements destroyed. All land in the entire area not used for parks and streets will be divided into 2,500 lots, thus eliminating future building in this project. The existing lots will be traded for the new improved lots, without monetary exchange. As the improved tracts will be worth far more than the present unimproved lots, the owners will benefit by the exchange, even though they will bear half the loss of razing existing structures, worth about $300 on the average.

Some 2,500 fireproof, masonry, two-bedroom houses will be built on the replatted site, each having a nominal value of $2,600 but actually costing only $1,650 each because of mass construction operations. The houses will be purchased by present lot owners at a cost of $3.50 per week including taxes, interest and amortization under a 20-year FHA insured loan. Street, park and sewer improvements will be paid for by a special municipal bond issue of

$500,000 to be amortized solely by the taxes from the $3,000,000 increased values in this district. Utilities will be self-supporting.

Present site a hell hole

The site, roughly ⅔ mile wide and 2 miles long, extends northward from the Rio Grande through the heart of Laredo. To the west lies the main business district; to the east is the city's principal residential area, the two connected by only four through streets. Winding lengthwise through the tract is Arroyo Zacate, an unsightly, gully-pitted dry wash that carries storm drainage to the river.

Sprawled down the banks of the arroyo and throughout the site are 2,550 dwellings, only 150 of which can be classed as standard or habitable. The other 2,400 are miserable shacks and shanties without lights, water or sewers. Water supply is by outside hydrants, each serving a group of shacks. Surroundings are squalid and filthy; the tuberculosis and other disease rate among the residents is so high as to be a health menace to the entire city. Residents, all Mexican, are about equally divided between home owners and renters.

Within the tract are a new USHA multiple-dwelling housing unit known as Colonia Guadalupe, a new boys club building now serving as the city's USO center, and several churches, all of which will not be disturbed by the new development. Present standard houses and a few stores likewise will remain, though most of them will be moved to new locations to conform with the general layout.

Site to be replatted

All of the existing shacks will be demolished, the entire tract will be regraded and replatted with a new street system including many winding lanes and various size park plots. The arroyo will be spanned by five new bridges, channeled and landscaped and the banks sodded. Several low dams will be built to create a string of lakes in a park setting; water for the ponds will be pumped from the river. Electric, water, sewer and gas lines will be installed throughout, so every home will be thoroughly modern. Playgrounds and community centers will be established. A section has been reserved for commercial buildings to be erected by their owners, separate from the housing development.

The magnitude of the project is revealed by a few statistics: New individual houses, 2,500; street paving, 360,000 sq. yd.; sidewalks, 365,000 sq. ft.; park area, 124 acres; water lines (excluding house connections) 68,000 ft.; sanitary sewers, 76,000 ft.; and gas mains, 64,000 ft.

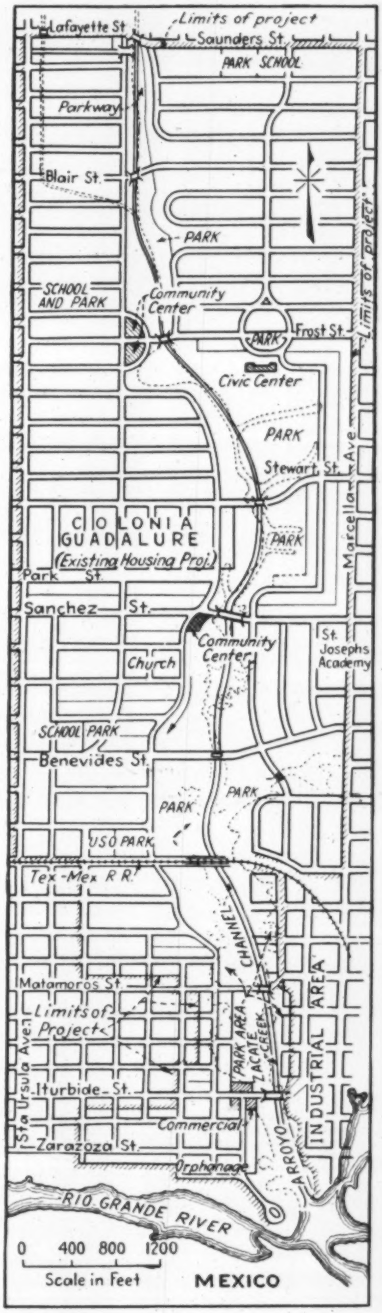

Limits of project
Lafayette St
Saunders St
PARK SCHOOL
Parkway
Blair St.
PARK
Limits of project
SCHOOL AND PARK
Community Center
Frost St
PARK
Civic Center
PARK
Stewart St.
Marcella Ave
COLONIA GUADALURE
(Existing Housing Proj.)
PARK
Park St.
Sanchez St.
Community Center
St. Josephs Academy
Church
SCHOOL PARK
Benevides St.
PARK
PARK
USO PARK
Tex-Mex R R
CHANNEL
Matamoros St.
Limits of Project
PARK AREA
ZACATE CREEK
INDUSTRIAL AREA
Sta Ursula Ave.
Iturbide St.
Commercial
Zarazoza St.
Orphanage
ARROYO
RIO GRANDE RIVER
0 400 800 1200
Scale in Feet
MEXICO

Fig. 2. Numerous parks, landscaped and channeled arroyo and new street layout are all part of the replatted 600-acre tract, now a slum area.

All preliminary engineering and development work is being done by the H. B. Zachry Co. on its own responsibility. Mr. Zachry has enlisted the aid of city officials, prominent citizens, the Laredo Planning Board, the Webb County Bar Association, churches and welfare organizations. City ordinances, sponsored by the bar association and the planning board, are necessary to get the plan under way. Among the legal steps to be taken are:

1. The Housing Authority of the City of Laredo will have to declare and locate the slum area. This organization, already constituted, is operating in the city. Under the statute, the housing authority has the power to declare a district a slum area, and every building in such area is then subject to the right of eminent domain and can be acquired by the authority in the interest of the project.

2. The City of Laredo, acting in cooperation and conjunction with the housing authority, will have to:

    (a) Pass an ordinance locating and defining the area to be a slum.

    (b) Pass an ordinance declaring buildings, which are located in the slum area and which are considered to be substandard, to be a nuisance and providing for their removal.

    (c) Enact a comprehensive zoning ordinance and define conforming and non-conforming uses.

3. A corporate charter will have to be secured so that deeds of conveyance can be obtained from the property owners in the slum area conveying their lots to the corporation. Such deeds will require that unless the project is commenced within twelve months after the cessation of war hostilities, the title will revert to the grantor.

After these steps have been taken it would be necessary to abandon the old subdivision and create a new subdivision in accordance with the plan of development. Finally, it would be required to enter into a predeveloped contract of sale with the prospective purchasers of lots or units in the area to be developed; for the most part this would be with the grantors of the lots in the old subdivision.

Those persons whose property does not conform to the use as that term

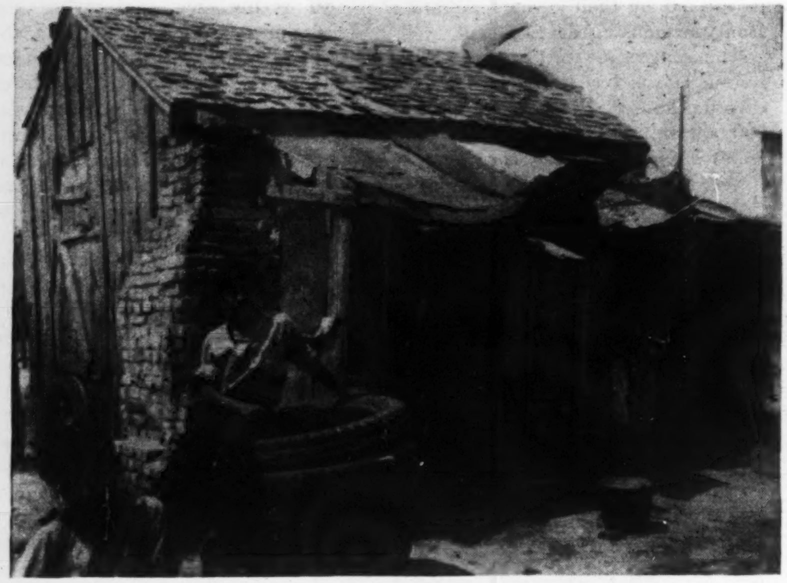


Fig. 3. Lacking sewers, light and water, this shack is typical of 2,400 substandard dwellings to be replaced with modern houses to become property of present tenants at a cost of $3.50 per week.

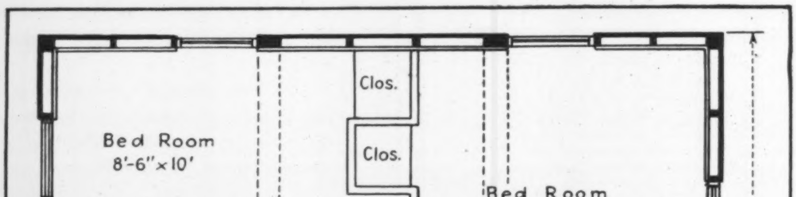


Fig. 4. Most of the new houses will be built on a 24x24-ft. floor plan with varying room layouts and exterior treatment. This is one of the many typical floor plans. A few houses will contain three bedrooms on a 24x30-ft. plan. New homes are expected to cost only $1,600 a piece.

is defined in the city zoning ordinance, would be subject to having their property abated as a nuisance at their own expense by the city; title to the lot would remain in the original owner, but the zoning ordinance would control the use of the property thereafter. Those persons whose property does conform to the use as that term is defined in the city zoning ordinance, although not subject to abatement proceedings by the city, would, nevertheless, be subject to eminent domain proceedings by the housing authority, and title to the property could then be acquired by the authority and transferred to the housing corporation. This is in addition to the power of eminent domain already held by the city for acquisition of property for streets and parks.

The townspeople and city officials are wholeheartedly behind the plan, and since the first of this year all real estate transfers within the district have cleared through the Laredo Planning Board to control outside speculators. Of course, while the city can condemn insanitary housing and force razing of the structures, no law can compel an owner to build a new house on his property or on that offered in exchange. However, proponents of the plan feel that few owners would be so foolish as to turn down the chance to get a $2,600 house for $1,600. However, if found necessary for the benefit of the project, his property could be acquired under eminent domain proceedings as above outlined. Because the plan will replace existing houses without creating additional housing capacity to disturb the city's real estate balance, the realtors are behind the scheme in hopes it will stimulate other home building.

Development by sections

The plan contemplates starting in an area where the land is largely vacant so a group of houses can be built before razing others. Then another section can be tackled, moving existing occupants into the completed homes. After these vacated houses are razed, new homes will be built and residents of another section will be moved in. This cycle will be repeated until the project is complete, estimated to take about one year. No construction will be started until after the war, though preliminary

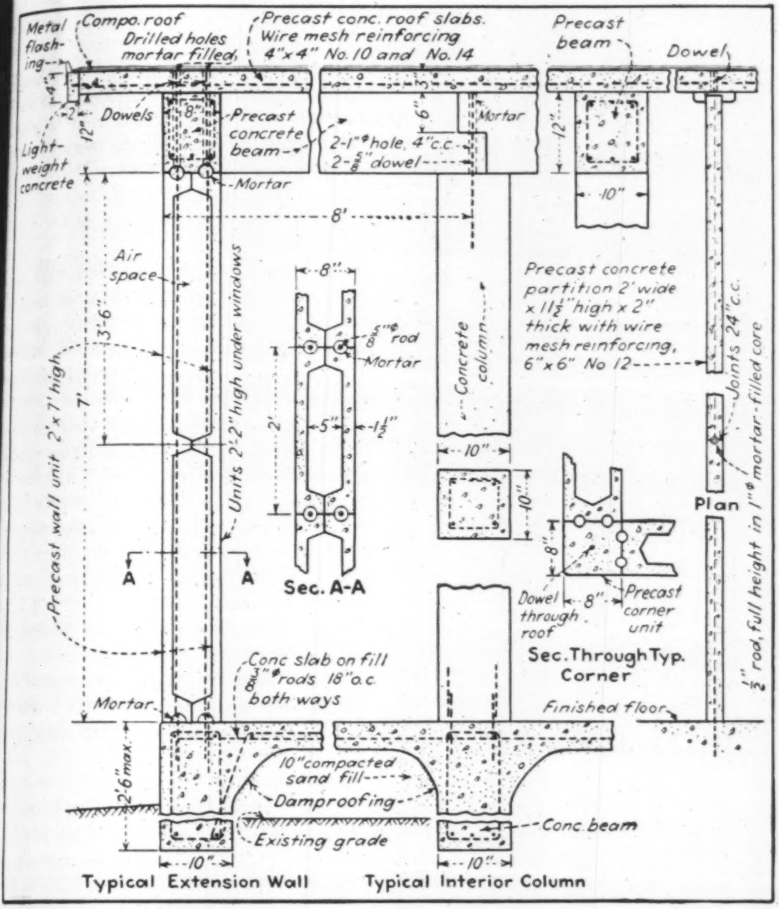

Metal flashing
Compo. roof
Drilled holes mortar filled
Precast conc. roof slabs. Wire mesh reinforcing 4"x4" No. 10 and No. 14
Precast beam
Dowel
2"
Dowels
8"
12"
Precast concrete beam
6"
Mortar
12"
Light-weight concrete
2-1"φ hole, 4"c.c.
2-5/8" dowel
Mortar
10"
8'
Air space
3'-6"
8"
5/8"φ rod
Mortar
Precast concrete partition 2' wide x 11½" high x 2" thick with wire mesh reinforcing, 6"x6" No 12
Joints 24" c.c.
Mortar-filled core
Precast wall unit 2'x 7' high
7'
Units 2'-2" high under windows
2'
5"
1½"
Concrete column
10"
10"
Plan
8"
1/2" φ rod, full height in 1"φ mortar-filled core
A
A
Sec. A-A
Dowel through roof
8"
Precast corner unit
Sec. Through Typ. Corner
Conc slab on fill 3/8"φ rods 18" o.c. both ways
Mortar
Finished floor
2'-6" max.
10" compacted sand fill
Dampproofing
Existing grade
Conc. beam
10"
10"
Typical Extension Wall
Typical Interior Column

Fig. 5. Many houses will be of precast concrete wall and frame construction according to these details. Others include tile and stucco walls with a concrete frame. Roofs will be flat or pitched, the latter supported by light trusses.

legal and engineering work are now under way and are expected to be fully completed before the post war period.

Upon passage of ordinances creating the public improvement district and authorizing the formation of a private housing corporation, the Zachry Co. will go ahead with final plans. When ready for construction, the work will be thrown open to competitive bids, with Zachry bidding as one of the contractors. If he is not the low bidder, he only asks reimbursement for preliminary development expenses, estimated to amount to $50,000, and he will then step out of the picture.

FHA has agreed to insure the mortgage on this new construction, regarding the greatly increased value of the improved lot and the $1,000 equity in the house made possible by mass construction as sufficient down payment, to justify the risk inherent in this type of borrowing.

Zachry architects and engineers have developed several typical floor plans with a variety of exterior treatments, all one-story houses of Spanish architecture. All buildings will be masonry, either precast concrete wall and frame units or stucco-covered tile with a concrete frame. The base of each house will be 24x24 ft. in plan.

Typical room arrangements include a living room, two bedrooms (a few three-bedroom layouts), a bathroom complete with shower, a combined kitchen and dining room with built-in sink and cabinets, a water heater, plenty of closets and space for a refrigerator and a gas range. Heating will be by small gas stoves. Each house has a porch, either as an exterior projection or recessed into the base plan.

Most of the houses are designed as all-concrete structures with precast beams, roofs and walls. The walls are made up of 1½-in. ribbed concrete slabs, 24 in. wide, extending full story height of 7 ft., or 2 ft. 2 in. high to fit under the windows. These slabs, known as "Makeco" construction, are fastened together by reinforcing rods set in circular grout-filled keys. Two slabs, placed back to back, form an 8-in. hollow wall. They rest on concrete grade beams, and frame into precast top beams, as shown in the details in an accompanying illustration. All houses have concrete floors, poured directly on a 10-in. fill of compacted sand.

Project direction

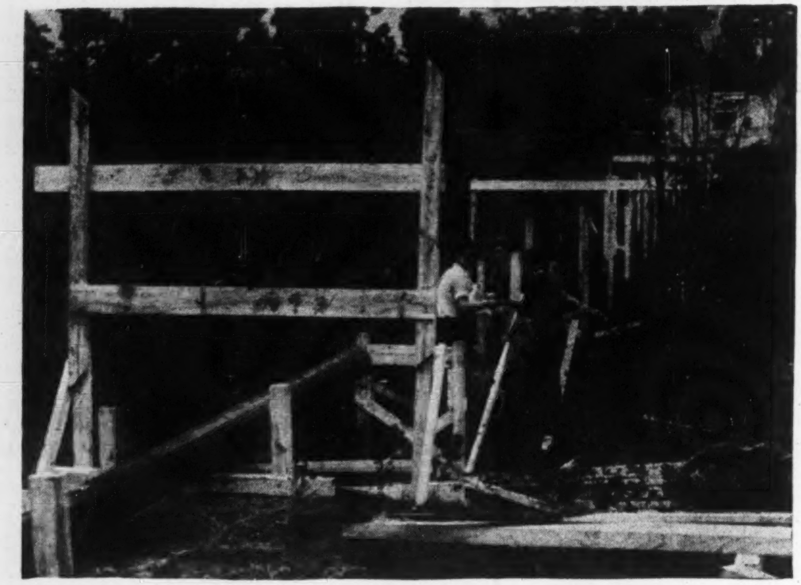
H. B. Zachry, originator of the Laredo Plan, is president of the H. B. Zachry Co., with offices in San Antonio and Laredo, Tex. A. Cavazos, secretary of the firm, is in immediate charge of development work. R. M. Ayres and G. M. Baker, architects associated with Mr. Zachry, are working out the architectural and structural details.

Redistribution of Army Construction Materials

During 1943, approximately $150,000,000 of excess construction materials, ranging from bolts and nuts, rivets, and rods up to heating boilers and hot water generators, were salvaged from completed Army projects and redistributed to incompleted Army projects and to other war activities by the Redistribution and Salvage Branch, Office, Chief of Engineers.

It is estimated that materials valued at $75,000,000 were redistributed to Army construction projects during the first six months of the year, but during the last half of the year, the war construction program of the Army decreased so greatly that transfer of excess stocks were made to other war activities, including Navy construction projects. Another $75,000,000 of materials were utilized in this manner.

At present, the War Department announced May 15, redistribution of all excess Corps of Engineer property, military and non-military, is proceeding at a rate of about $11,000,000 a month.



Rush schedules called for temporary expedients, such as illustrated at left. At this cantonment site a trestle is being built to support a water main across a gully that later will be filled.

Water Utility Construction On War Projects

Myron T. Jones
Registered Professional Engineer
Columbus, Ohio

Editor's Note—Looking back over experiences with the installation of water and sewer utilities on four big war jobs, Mr. Jones tells of some things that might be handled differently under similar emergency situations. In particular he cites the necessity for co-ordination of operations, careful inspection and proper sterilization of mains prior to use.

COMPLETION of our huge cantonment, ordnance plant, and defense housing construction program lends timeliness to a review of some problems that arose during the planning and construction phases. This recital of experiences relating to the installation of utilities is prompted by the hope that it may prove useful in the event of future emergency conditions.

It will be recalled that much of the earlier construction kept pace with or was ahead of the design operations. Not infrequently the architect-engineer arrived on the job at the same time the contractor was beginning work, and detailed plans were made as construction proceeded. Buildings could not wait to be built after the underground utilities were installed and often there were piles of materials in the way of sewer and water lines, resulting in many arguments about which should have precedence. Every sub-contractor considered his work the most important, and good coordinators were much in demand.

Design layout as well as construction called for the closest coordination to avoid conflict in the location of utilities. Changes had to be made frequently and it was essential that each department be kept informed of the latest change in another department. A policy of "get my stuff in first and let the other fellow worry" could easily result in higher costs and serious trouble.

It should be remembered that the planning and construction of a 30,000-man cantonment involves approximately the same amount of utility construction as in a city of similar population. Many ordnance plants occupied areas far larger than industrial plants of like size, and this made the utility mileage higher. While there was not the time available to give this type of installation the study that it would normally justify, the fact that the project could be planned as a whole generally resulted in much better overall design than that found in a city of similar size.

The stipulation that war-created installations be designed on the basis of a "five-year life" is one that may lead to trouble if applied to utility construction. For example, the use of inferior pipe for water supply lines involves relatively small savings in material costs. Thus, the requirement of the War Production Board that black steel pipe be used for underground water services in defense housing projects was an economic waste in localities where the mineral content of the local water supply rapidly ruined the pipe and also resulted in chemical action that made the water unpalatable. Savings in pipe costs will average less than five percent of the cost of pipe installation, and since labor was far more critical than some restricted materials the necessity of rebuilding resulted in far greater economic loss than if materials of proven quality had been used in the first place. The same criticism can be directed at the use of wooden supply mains.

A large number of projects suffered from the lack of foresight through the installation of water mains under ditches. Many mains were laid with the required cover to prevent frozen pipes only to have that cover removed by the construction of drainage ditches at a later date. However, installation of pipe at lower than normal depths in order to maintain proper cover under ditches necessi-

d the wide use of hydrant exten-
ns, and many a hydrant manufac-
er was kept busy furnishing parts
these extensions. This difficulty
ntually was minimized by ordering
drants of various lengths so that se-
tion could be made on the ground
the proper length of hydrant in
der to meet a given condition.

Sterilizing water mains

Sterilization of water mains offered
blems at many projects. One of the
ncipal difficulties was traced to the
lure to properly flush all service
nections before the mains were
rilized.

Many of these service connections
olved the use of pipe large enough
require packing for poured joints.
ench water would often stand for
eks in such connections causing
teria to breed in the jute packing
d it would be impossible to flush
se lines due to the fact that plumb-
connections had not been com-
ted and also because of the poten-
l hazard of freezing the plumbing
nections in cold weather. It was
nd economical in most cases to go
some expense in disconnecting and
aining the plumbing in order to
sh the services, for unless this was
ne it was virtually impossible to
tain the required sterilization re-
lts in the mains themselves.

Rubber gaskets were found far
ore desirable than jute or hemp
om a sanitary standpoint. However,
hen it was impossible to obtain rub-
r gaskets asbestos rope was used
ith satisfactory results in bell and
igot pipe. If it is necessary to use
te it is suggested that it be placed
a strong chlorine solution before
ing.

Following is a suggested procedure
minimize the need for the repeated
erilization of water mains:

(1) Make sure that all pipes and
aterials which go into water supply
nstruction are as clean as possible.

(2) In so far as is practically pos-
ble keep all trench water out of
ipes. If metal stoppers are caulked
ith temporary packing at the end of
ch day's laying at all open pipe
nds, and if all tees and branches are
omptly plugged pending later con-
ction, the cause of much of the dif-
culty is eliminated.

(3) Insert enough chlorine in each
ipe to form a chlorine solution of 50
pm. in case trench water should get
into the pipe. This will enable the chlorine to partially and in some cases wholly prevent the accumulation of bacteria in the joints while the pipe is being laid.

(4) Fill lines slowly before testing so that the chlorine in the pipe will not wash to one end; after testing at the required pressure, allow the chlorinated water to stand in the pipes from 24 to 48 hr. Services and hydrant connections should be opened long enough to obtain circulation of chlorinated water.

(5) Flush out all lines, hydrants and services for at least 2 hr. Test for chlorine in water. When all chlorine has disappeared test for contamination first by taking samples at various hydrants. If these are satisfactory take samples for each service from faucets inside buildings. Dirty inside piping can be the source of much contamination.

(6) If proper results are not obtained by the above procedure, sterilize the system with liquid chlorine to 50 ppm. and allow solution to remain from 24 to 72 hr. Thoroughly flush and retest as above indicated.

It is to be presumed, of course, that the source of supply and storage reservoirs have been previously sterilized and found satisfactory.

Location of services

The location of sewer and water services was the source of trouble on a large number of projects. Standard government drawings would show the outside stubs in one location and approved plumbers' shop drawings would show them in another. Unless this information was properly shown on the sewer collection and water distribution drawings, the outside services would often be run to the wrong location at the building. Here again proper coordination was necessary. It was found both practicable and necessary to have the field engineers set the vertical and horizontal location of each outside stub for both the plumbing and outside utility contractors.

Proper and intelligent inspection of all utility construction is vitally necessary whether the work be on a cost-plus-fixed-fee or contract basis. Inspection should be done by capable and conscientious men who are thoroughly familiar with all phases of the construction work they have under their scrutiny.

An inspector can save the client and contractor money by insisting on proper workmanship as the work progresses. He should pursue his work with the idea of preventing trouble—not allowing faulty work to proceed and then ordering it done over. While it was difficult to secure enough qualified inspectors who could work without constant supervision; best results were obtained by the training and proper supervision of conscientious men than through the use of some inspectors with more experience but who were also either careless, tactless, autocratic or lazy.

Engineers, architects, and contractors who took part in the high pressure construction activity during the past four years have learned many lessons that should serve them well on future jobs.

Peru Plans Development Of Highway Systems

Peru's intensive development of communications will provide a big new market for transport equipment in the postwar period, according to Hector Boza, former Minister of Public Works in that country.

"New highways are opening remote regions to trade and colonization," Mr. Boza said on a recent visit to the United States. "Our coastal desert, mountain ranges and Amazonian lowlands have all been linked by a network of airlines. We need trucks and airplanes. Our transportation equipment needs will not remain static. Peru looks to air transport improvement and highway construction for development of its natural resources and integration of its economic and social life. New roads are cheaper to build over the mountain ranges than railroads.

"Peru's most ambitious undertaking in development of communications was construction of a highway over the Andes into the Amazon valley from Lima, the capital adjacent to the coast. This road was started six years ago and was completed recently. It is nearly 400 miles long. At some points it climbs as high as 16,000 feet to cross cordilleras.

"Its completion opens a transcontinental land-water route across the Amazon basin. It also opens Peru's eastern slopes of the Andes and Amazon country to development from the west for the first time in history."

ENGINEERING ABROAD AS SEEN BY ENR EDITORS

Construction in the Tundra

Harold W. Richardson
Western Editor, Engineering News-Record

Contents in Brief*—War construction in the Aleutian Islands is a battle against the elements and unfavorable ground conditions. The barren, treeless islands are covered with tundra, a swampy, vegetal mat that must be removed or covered up with stable material in building roads and airports. Here the engineers developed a new technique in roadbuilding, born of necessity in establishing access routes in a hurry. Housing follows a regular routine from tents to comfortable huts on each island. Empty oil drums are an all-purpose construction item. Pit-run aggregates from the beach turn out suitable concrete.*

BULLDOZERS COME FIRST in the far-flung bleak Aleutian Islands, where the wet, swampy tundra blocks all progress until removed or covered with more substantial material. As our troops advanced island by island westward through the Chain, the first job upon landing at each island was to provide access—access ramps to the beach for unloading the landing barges, access to emergency storage dumps and housing areas, access to the runways that must be built in a hurry, and access to gun and radio stations that must quickly be es lished. This means roads, roads more roads. Then as the pattern constructing each base develops, ditional roads are needed—roads serve the permanent troop hous the airports, the docks and w houses, the shops and field headq ters, the water supply and the ou ing observation posts. Bulldo build these roads, the ever-pres indispensable bulldozer, followed shovels, trucks, scrapers and d lines. But the bulldozer always co first.

Roadbuilding in the Aleutian t dra is something different from a thing ever encountered in the Uni States. Tundra is a wet, vegetal m

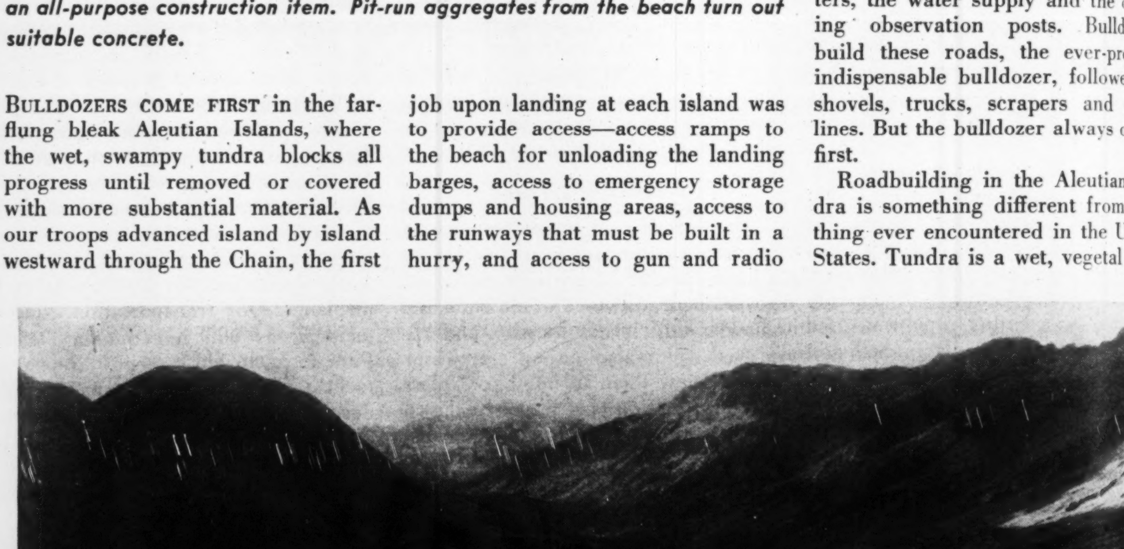


Fig. 1. Typical of many fine roads our engineers have built in the Aleutian Islands.

eavy grass overlying a peat-like from 2 to 10 ft. deep, barren and less. Underneath the tundra is hardpan, sand or gravel, almost ys a firm material. Some of the ds are fringed with dunes of fine, anic sand, a suitable material for

he engineers have developed two eral methods of building roads oss this swampy ground—one is to e the tundra undisturbed and ld over it; the other is to remove muck to firm base and backfill h stable material, such as sand or vel. Depth of tundra, equipment materials available determine the thod used in each case.

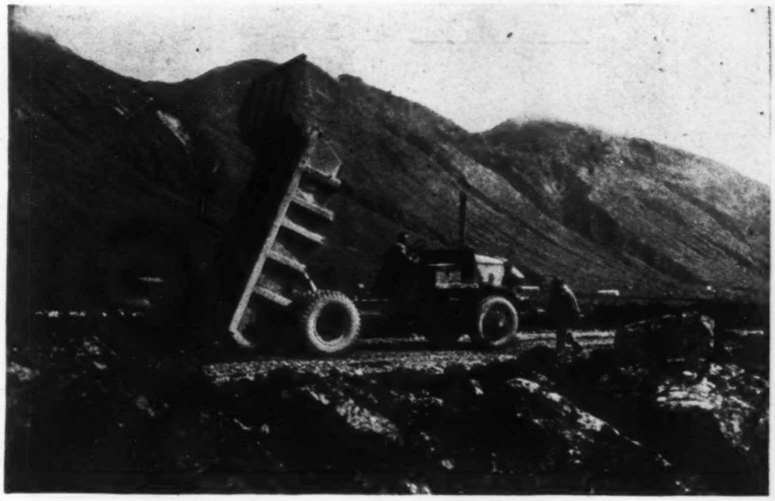
Roadbuilding on top of tundra

Undisturbed, the tundra grass is able of supporting a good load. erefore, if the muck is too deep to de out easily, the sand or gravel is carried on top of the grass when table equipment, such as trucks, is hand. This method requires care, once a truck or bulldozer breaks ough the grass mat it bogs down. ideal construction procedure in s case is to use light dump trucks t can be backed to the end of the to discharge the load, then shove dumped pile ahead and spread it h a bulldozer.

This is not always the simple procedure it seems to be. For instance, one island all the sand, piled up in nes, was very fine; all the gravel om the beach, the only source, was ooth, round pebbles of uniform e. If sand alone was used for the over the tundra, the trucks could t pull through it to reach the point dumping. When gravel alone was ied, the truck wheels merely churned the round pebbles and bogged wn. The only solution was to carelly mix the sand and gravel on the ad with a bulldozer as work proessed, a slow, but eventually sure ocess.

Sometimes trucks are not available, d the big tractor-hauled scrapers ust be used for placing the fill over e tundra. In such cases it has been und best to greatly widen out the adbed so the dirt-moving units can rn around on filled ground. Otherise, the tractors and scrapers bog own in the swamp once they leave e fill.

If the tundra is not over 2 ft. or so depth, often the muck is scraped to one side with bulldozers, exposing a hard base. Upon this firm foundation a backfill of good material is placed. To keep the excavated trench from becoming a drainage ditch through the swamp the fill must be raised above original ground level.



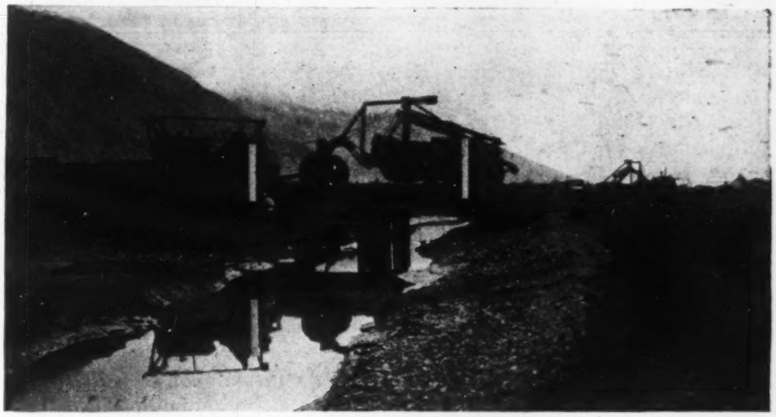


Fig. 2. On some islands, good roadbuilding equipment was available. Top: Dump truck placing quarry-run surfacing material. Bottom: Scraper on its way to the borrow pit crosses a creek, whose gravelly bottom was used as a roadway from the beach during early stages of the invasion.

Quick to take advantage of any break nature offers, the army engineers on one island developed a peculiar technique in roadbuilding. Here the tundra was shallow, only a foot to 18 in. deep. Underneath lies a smooth, soft rock of thin laminated structure. First the muck was bladed to the sides with bulldozers. Then a heavy rooter tore up the top 6 in. or so of rock in slabs. This ripped-up rock, left in place, was crushed to road-surfacing size by merely running a tractor over it several times. The tractors not only crushed the rock, they packed it down to a smooth, suitable roadway surface.

This procedure, of course, left the roadway below swamp level. A few additional passes of the rooter along the edges loosened the rock to a depth of another foot. A road grader with tilted blade could then gouge out the loosened rock and throw it to the outside, thus excavating perfect drainage ditches. Lateral ditches were dug leading off from the roadway to carry the drainage to low-lying ground. These are some of the finest roads in the entire chain of islands.

On some islands rock is quarried and crushed for the final road surfacing. Where rock is not available, beach gravel, usually mixed with sand as a stabilizer, serves as surface material. At one of the bases, however, neither rock nor gravel is available,

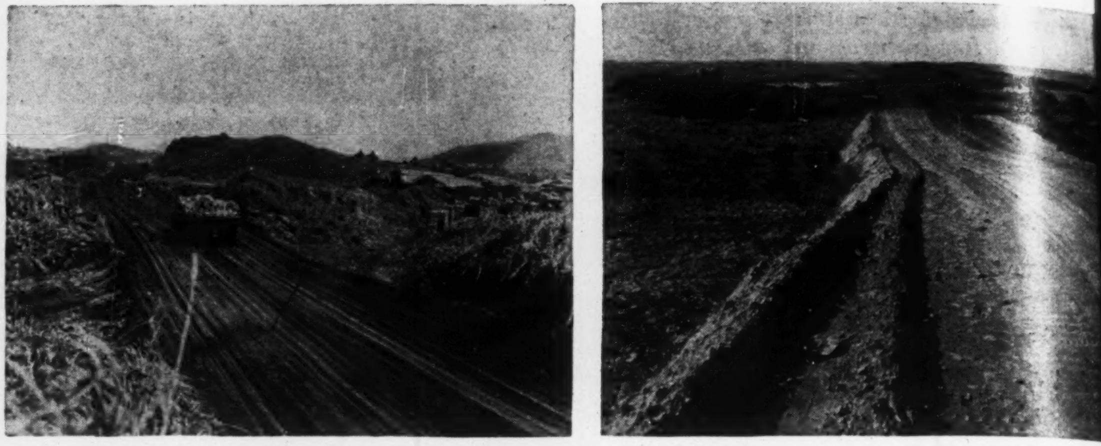


Fig. 3. Two types of Aleutian roads. Left: Hard-packed sand highway through shore-line sand dunes. Right: Sand crushed rock spread over the tundra mat without disturbing the swampy base.

but the engineers found great quantities of boulders along the coast, which, when gathered up and run through a crusher make fine surfacing material.

Runways and airports, of course, are important features of the Aleutian bases. Landing strip construction largely follows roadbuilding methods, except for the steel mat surfacing. Airport construction will be described in an early issue.

Oil drums a construction material

Because the barren Aleutians offer nothing in the way of construction materials, other than rock, gravel and sand, the engineers improvise and substitute materials in most ingenious fashion. Take road culverts, for example. Empty steel oil and gas drums make excellent culverts. First the ends are cut out, but not wasted, for these round disks are used for road and direction signs. Then the open-end drums are fastened together into a continuous pipe the necessary length. Sometimes the drums are tack welded together, sometimes they are wired through holes punched near the ends, and again they are held by placing a couple of planks or timbers along the outside as a rail, and spikes driven through the planks and the steel shells, when clinched inside the drums, fasten the units together and in line. All culverts on the entire Aleutian system of highways are made up of steel drums. Often the headwalls that hold the road fills in place are sandbags. Army engineers with Mississippi River levee and flood experience are experts in making walls out of sandbags.

Culverts are not the only use for empty gas drums in the islands. Most of them, of course, are returned to the States for refilling, but others are retained as construction material. Filled with sand, they act as foundations for shops and warehouses, especially on uneven ground. Also, when filled, they are stacked up into retaining walls to restrain fills or to protect excavated areas. A double row of filled drums on end makes a suitable elevated service pit for trucks, jeeps and tractors. They form walls for emergency buildings, and windbreaks for outdoor shops. Empty and made airtight, the drums serve as floats for landing stages, as supports for submarine nets, and as channel markers and buoys in the harbors. Lastly, many an emergency cooking and heating stove has been made out of an empty oil drum.

Housing follows regular pattern

Living in the tundra can be fairly comfortable, but it takes pains and effort. First the housing is entirely tents, revetted into the wet ground as part protection against the wind and possible bomb fragments. The troops are industrious however, and before long gravel floors appear in the tents, gravel walks lead to them. Then, as scrap packing case and other lumber becomes available the floors are boarded, and duck board walks are built. Each tent has its own Sibley coal burning stove, adequate heating even in the rawest of weather. Worst trouble encountered with the tents is the difficulty in holding them down in the high winds with stakes driven into the soft tundra.

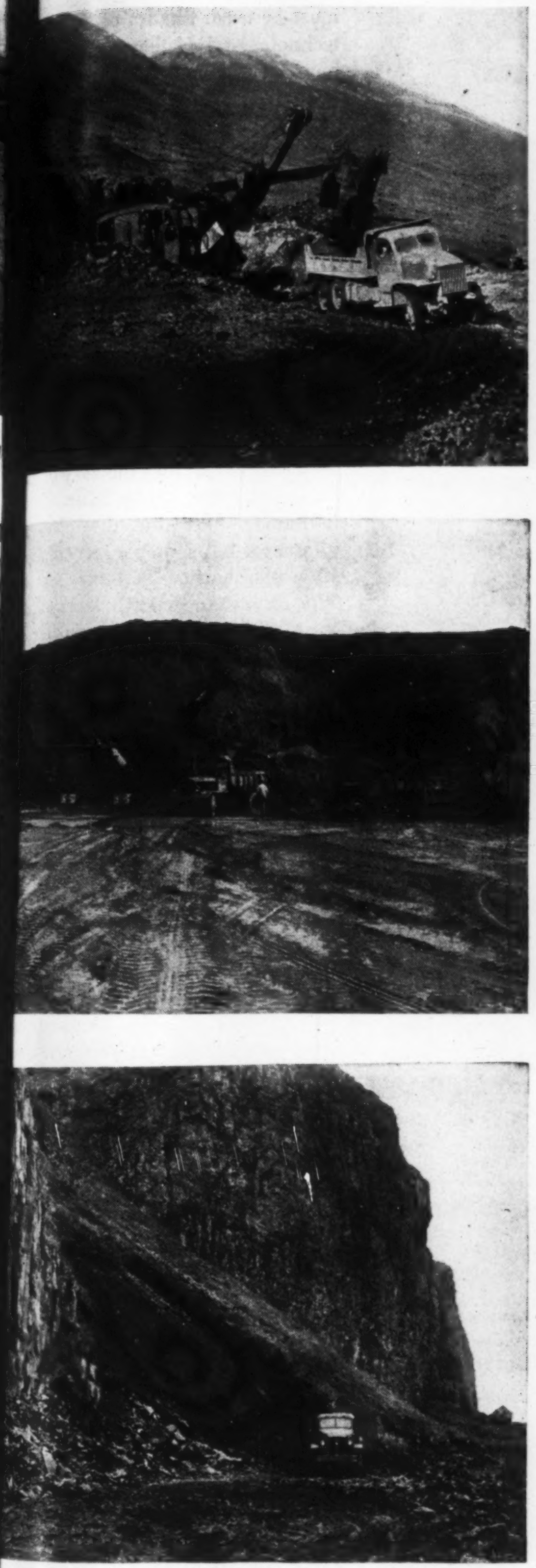
Rain, wind, dampness and f
sand are the most uncomfortable
tures of living in the Aleutians.
is not so troublesome, as the tem
ture seldom drops below 20
above zero, even in midwinter.
the cold is always raw and dam

First job in building an Ale
base is to get the essential mil
facilities established, then efforts
be turned to better housing. Tr
temporarily assigned to a post
probably continue to live in tents,
just as fast as it is possible to b
in the required materials, perma
housing is being built for the reg
contingents.

All such housing is assembled f
prefabricated units. The Navy
fers metal huts of the Quonset t
insulated and floored. Wooden h
are preferred by the Army beca
moisture does not condense on w
as readily as it does on steel. The m
popular type is the Pacific hut, b
up of plywood panels with a se
circular roof. Two such huts pla
end to end make excellent field offic
They are normally windowless,
dormer windows can easily be
stalled in the curving sides. Anot
type is the Yakutat Hut, a squ
shack of prefabricated wood pan
All are insulated and stove heat
though occasionally unit oil heat
are seen.

All housing, even tents, and
buildings, in fact, are lighted wi
current furnished by portable lig
plants. These blessed units are no
standard equipment for every arm
and land-based navy outfit.

Mess halls and kitchens go throu
the same process of evolution as do



ig. 4. Fill material comes from several sources. Top: De- mposed rock borrow pit beneath the tundra. Center: eep sand pit found under a swamp cover far inland on mchitka. Bottom: Talus slope between two rocky cliffs.

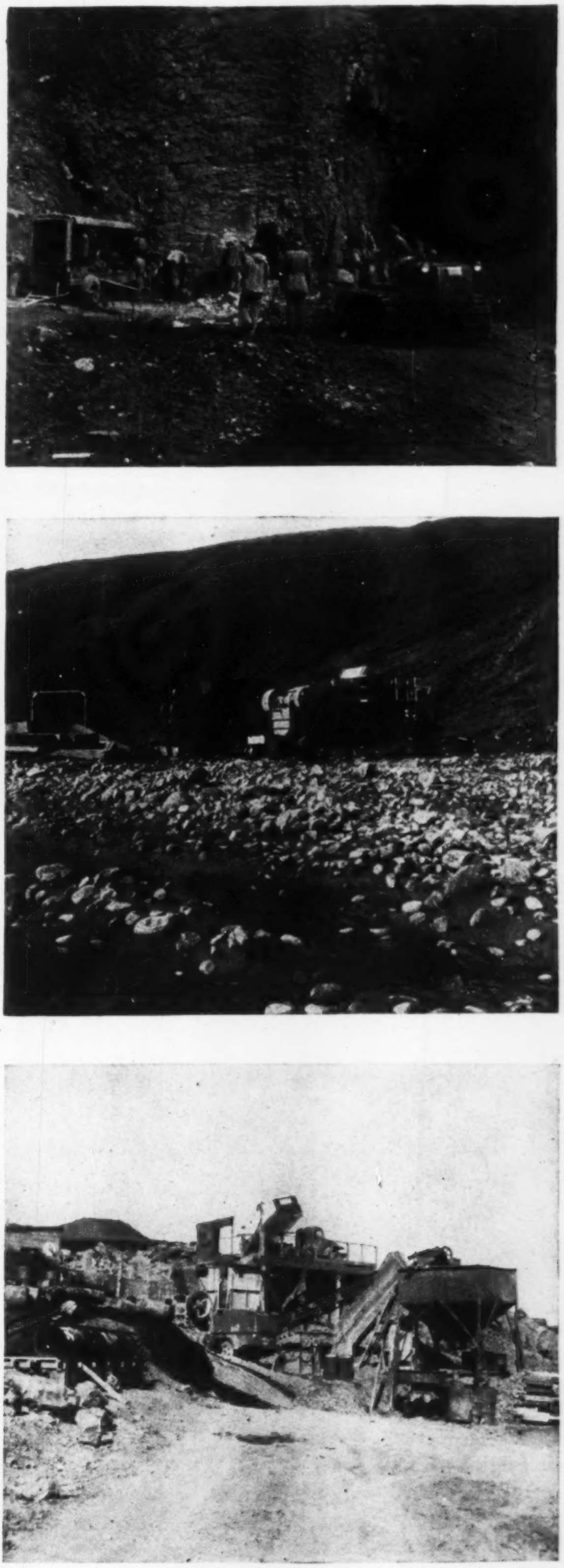
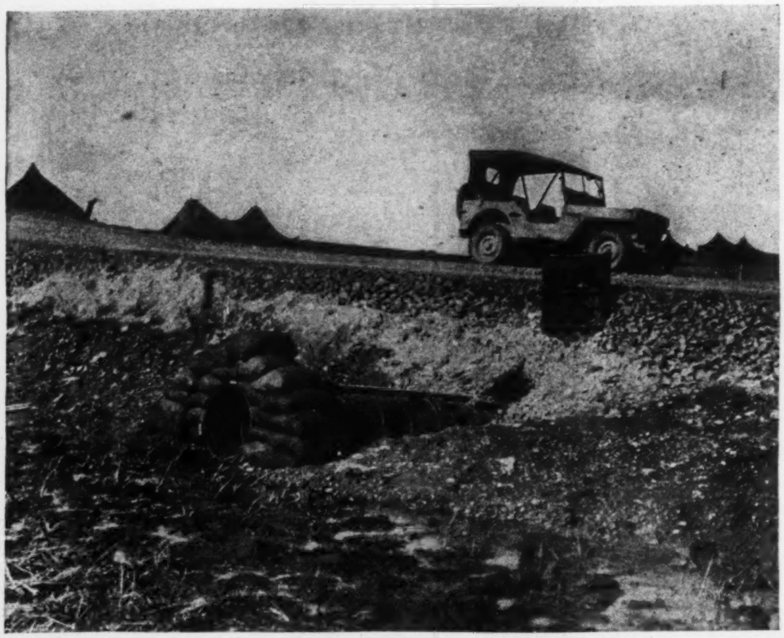


Fig. 5. Rock makes the best road surfacing. Top: Tunneling coyote holes for quarry blast. Center: Beach cobbles crushed in portable crusher were the main source of rock. Bottom: Crushing plant for processing quarried rock.



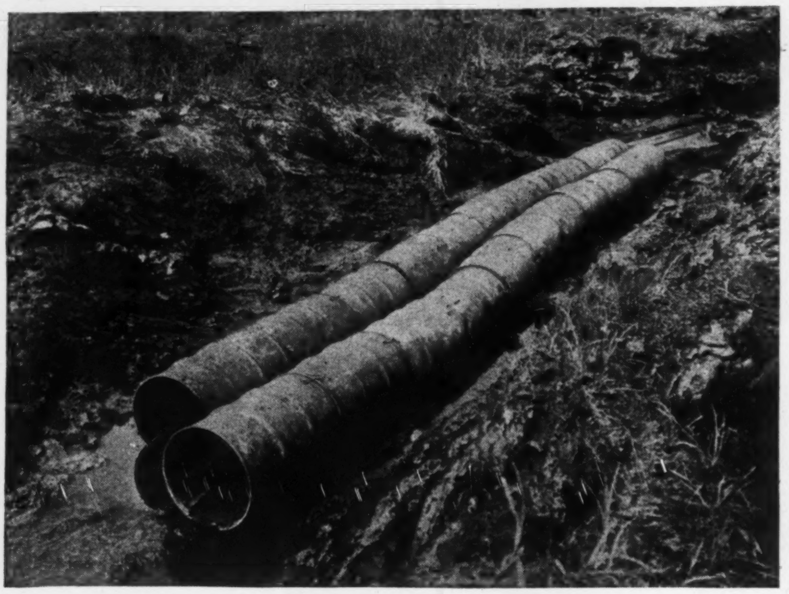


Fig. 6. Steel drums are universal culvert material for Aleutian roads. Top: Drums are fastened together by outside wooden rail; Note the sandbag headwall. Bottom: Wire ties hold endless steel barrels together for long double culvert. Sometimes the drums are welded together.

the housing. First they are tents, then later large huts or wooden buildings replace the canvas. Shops and warehouses are usually wooden structures, built from loose lumber with prefabricated timber truss roof supports. Cold storage warehouses are high in the building priority list, for until they are built fresh rations cannot be accommodated. A few weeks of living on field rations is enough to spur all concerned into rapid construction of cold storage.

Sometimes these large shops and warehouses are built with concrete foundations and floors. No screening equipment is available to properly grade and separate the aggregates, so "pit-run" beach sand and gravel, in proportions as they are found in place, must be used. Shades of the con technologists! If they could onl how Aleutian concrete is mixed.

Waterfront facilities

Another mighty important p of Aleutian base construction is waterfront facilities. Building a tary base in barren country requ a tremendous amount of shipp and shipping requires port facili Military security precludes comp description of the docks and whar but they are extensive. First, hark must be found or created. Where a natural harbor does not e breakwaters and jetties to protect anchored ships from the fury of A tian storms have to be built.

Driving piles for the piers wharves is not a simple job either, often the harbor bottoms are r with little sand or silt cover, offer no toeholds or penetration for piling. In fact, to build one wharf a rock bottom it was necessary to f fill in the area with quarried rock provide support for the piles.

In the eastern part of the Aleuti chain, in common with the Alas mainland coast, the waters are so fested with marine borers that cr soted piling and underwater timb must be used. Activity of these pe is illustrated in the case of a pier untreated piles on the main coast th was completely wrecked by the bor in less than a year.

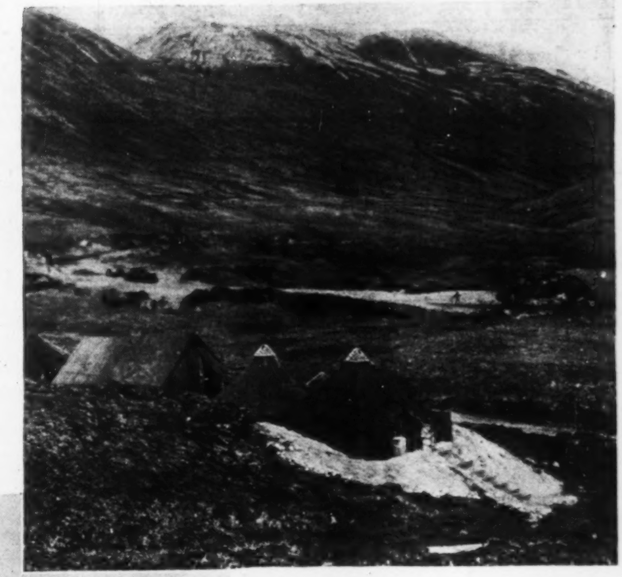
Construction in the tundra offe many problems. Yet, you can't st the Navy Seabees or the Army Eng neers, so the Aleutian bases are bei built as planned. They have alrea been the means of shoving the Ja out of the Aleutians. It will be inte esting to see the part they play in t final push against the Nippon hom land.

Direction

The Navy Construction Battalion the Army Engineers and civilian co tractors are all involved in Aleutia construction, but much of the wor described here is under the directio of the Army Engineers, headed b Brig. Gen. George J. Nold, staff engi neer, and Col. C. F. Baish, construc tion engineer, Alaska Departmen West Construction Co., Seattle, an Morrison-Knudsen Co., Boise, Idaho are the contractors, with A. M. Coke and C. R. Shinn, project managers respectively.

HOUSING AND WATER SUPPLY IN THE ALEUTIANS

Fig. 7. All Aleutian housing follows the cycle from tents to snug insulated huts (below). These are Pacific type insulated plywood huts preferred by the army. Wherever it is possible to do so, the tents and huts are set into hillsides to reduce their exposure to bitter Aleutian winds.



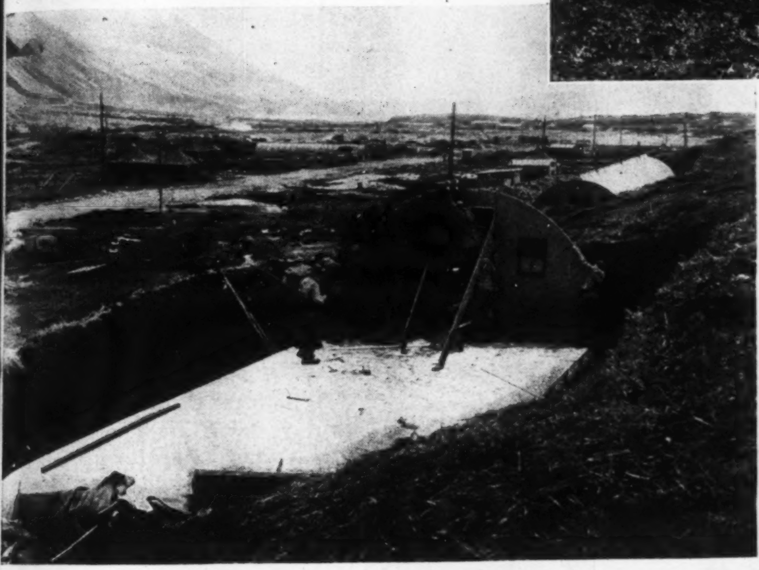
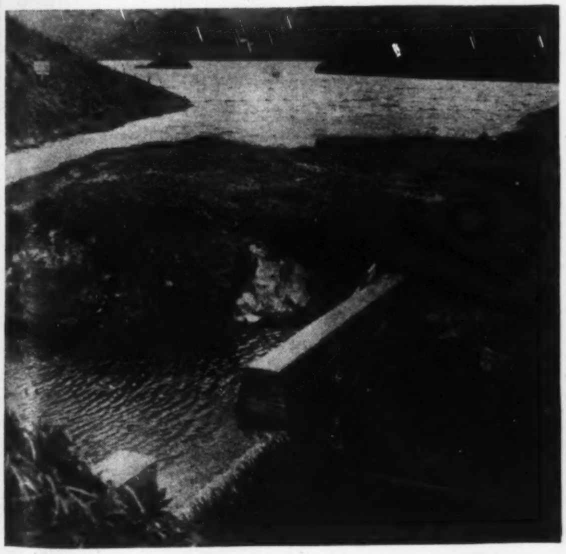


Fig. 8. Water supply is of first importance. A large lake of mountain water is impounded by a small dam, as shown at lower left. Until wells were completed, canvas tanks on small towers, filled from nearby lakes, were the sole water supply. All water, regardless of source, is chemically treated.



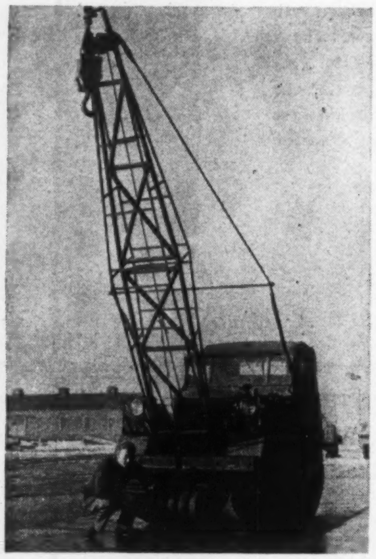
From Field and Office

WORKING PROBLEMS AND TIME-SAVING METHODS FOR ENGINEERS AND CONTRACTOR

Crane Boom Equipped With Supporting Wheels

During the four years I served in the U. S. Army, one of the most important arc welding jobs encountered was design and construction of a boom for a small tractor for lifting loads of ten tons or less. The all-welded boom was constructed of 1-in. and 2-in. aircraft tubing with a ¼-in. wall thickness. The base was slotted and reinforced with 1-in. bolts holding it to two uprights made of armor plating and set directly behind the bumper of the tractor.

The hook on the boom was made of six sided bar stock and tempered just enough to bend with severe strain. Channel iron and sheet steel were used for the sheave, which was reinforced with bosses in each section to prevent buckling. A ¾-in. flexible cable with a snapping point of 23.6 tons was used to hold the booms. The cable was spliced and placed right over the "ears" at the top of the boom, which are the reinforcements for the sheave.



Photos—Courtesy of Hobart Bros. Co.

Fig. 1.—Installation of a boom of 10-ton lifting capacity on a 5-ton tractor required addition of a retractable supporting wheel assembly.

The boom was designed for lifting ten tons, and when attached to the 5-ton tractor required a wheel assembly that would act as a fulcrum and hold the tractor on an even keel when hauling large loads around the airfield. The assembly was designed t be retractable. In the down positio it has a clearance of only ¾-in. abov the ground, little tilt being allowed.—STEPHEN E. STAWIANSKI, *of Holyok Mass, and recently discharged fro the U. S. Army.*

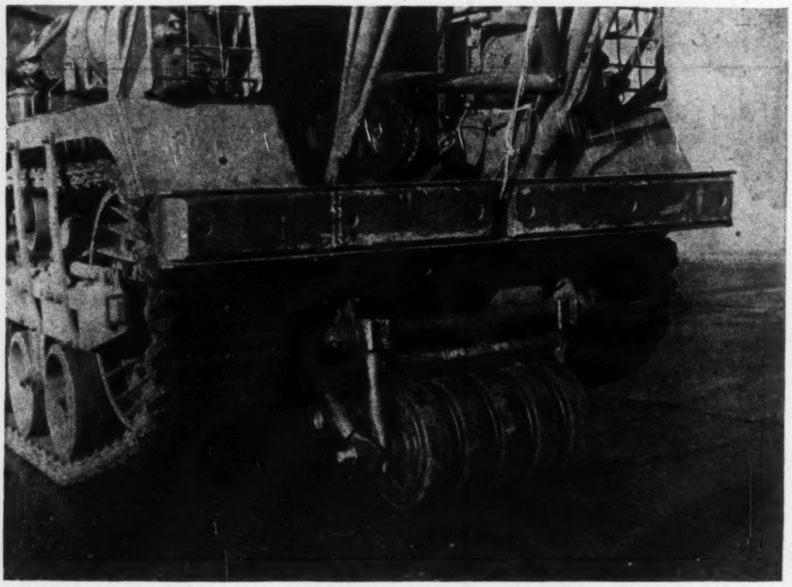


Fig. 2—In lowered position and with no load on boom, wheel assembly is ¾-in. above roadway.

Solving Quadratic Equations With a Slide Rule

Algebraic methods of solving quadratic equations are well known an may be found in any textbook on algebra. But when coefficients are larg as is often the case in engineerin problems, the solution may be tedious and time consuming. The write has found that quadratic equation with real roots can be quickly solve by slide rule.

The procedure is as follows:

1. Reduce the equation to the for

$$x^2 + px + q = 0$$

2. Set the slide rule so that the cross-hair on the indicator reads q on the D scale.

3. Shift the C scale until two numbers A and B are found such that $q/A = B$ and $A + B = p$.

4. A and B, with signs changed are the roots of the equation.

A numerical example will make the procedure clearer. Let it be required to solve the equation

$$13x^2 - 4{,}537x = 96{,}616$$

Reducing the equation to the required form,

$$x^2 - 349x - 7{,}432 = 0$$

Set the slide rule at 7,432 on the D scale, and shift the C scale until the numbers A and B are found. In this case the numbers are $+ 369.7$ and -20.7, since $+ 369.7 + (-20.7) = + 349$ and $+ 369.7 \times (-20.7) = - 7{,}432$. The roots, therefore, are $- 369.7$ and $+ 20.7$.

It must be remembered that this method can be used only on equations with real roots, because imaginary numbers are not indicated on the slide rule. Inability to find a solution by the slide rule method is an indication that the roots are imaginary.—J. J. DEL BOURGO, *Assistant Engineer, Shaw, Naess & Murphy, Earle, N. J.*

THE STORY OF THIS PRESSURE-TREATED BRIDGE*

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*On the St. Louis Division, B & O RR

ery engineer who is thinking in terms of permanent, onomical construction, immediate or post-war, can t some food for profitable thought from the history this 500-foot railroad bridge.

It was built in 1910, with 5 to 6 red oak piles per nt, and with a yellow pine deck. All material was essure-treated with creosote.

In 1930 a maintenance engineer inspected the ucture and found it in perfect condition. He pre-cted a useful life of 40 years, and on a straight-line sis estimated the total interest charges and amorti-tion as $1910 per year. In a similar structure, ilt of other materials, the interest charges alone—suming perpetual life, and no maintenance—were 3750 per year, almost TWICE the cost of the essure-treated wood structure.

According to current engineering reports, it is ly within the last five years that any serious deterioration has occurred, and only within the last two years that any considerable amount of renewals were necessary. It was stated that "The structure is still in fair condition and should not require any large expenditures for renewals or replacement for another 5 years." This will bring its age to 39.

If only a *30*-year life had been realized, the yearly interest and amortization charges would have amounted, on a straight-line basis, to $2100 a year . . . a saving of almost $50,000 for the period.

Perhaps a similar simple analysis of costs and life will point out some substantial savings-possibilities in some of the structures you are planning. Our bulletin will give you a picture-story of a few of many applications where pressure-treated wood is cutting construction time, costs, and maintenance. Ask for "Economical and Permanent Construction with Pressure-Treated Wood."

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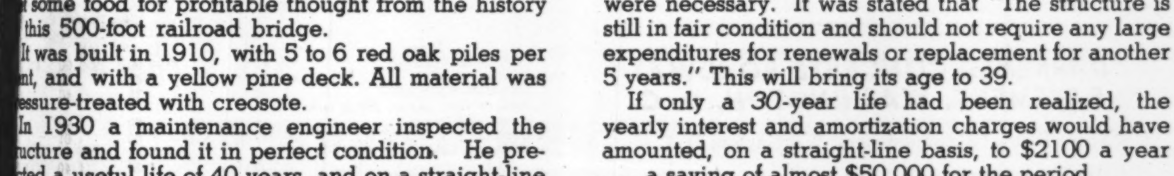

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

SHEET ASPHALT PAVING BOSTON, MASS.

OWNER: Public Works Department. Boston, Mass.

PROJECT: Sheet asphalt paving Rutherford Avenue, Ward 2, from Chapman Street to Cambridge Street, Boston, Mass. Involves 19,500 sq.yd. of sheet asphalt paving of 3-in. depth, laid in two courses (1½-in. binder course and 1½-in. surface course) over 4 to 6-in. cement concrete base.

CONDITIONS: Contractor to furnish all materials and complete work by Nov. 30, 1944. Highway transportation facilities available. One-half of the heavily traveled roadway must be kept open for traffic at all times. Wage rates are: skilled labor, $1.37½ to $1.87½ per hour; semi-skilled, 77c. to $1.30; and unskilled labor 50c. to $1.00.

BIDS: Seven bids were received May 9, 1944, ranging from the contract low of $54,974 to $65,230.

LIST OF BIDDERS:

1. Charles Capone, Roslindale, Mass. (contract)	$54,974
2. Warren Bros. Roads Co., Cambridge, Mass	55,060
3. Baker & Co., Hyde Park, Mass	55.700
4. Hancock Constr. Co., Jamaica Plain, Mass	57,000
5. Rosano Constr. Co., Inc., E. Boston, Mass	58,685
6. Edward M. Matz, Inc., Jamaica Plain, Mass	62,795
7. Earl M. Carriere, Roslindale, Mass	65,230

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Water box excavation	200 c. y.	$1.50	$2.00	$1.00
2. Bank gravel	20 tons	1.00	1.25	1.00
3. Old concrete base removed	200 s. y.	.50	1.00	1.00
4. Old granite blocks removed	19,500 s. y.	.40	.45	.45
5. Edgestone reset	300 l. f.	.38	.45	.35
6. Concrete base furnished and laid	2,700 c. y.	7.20	7.00	7.00
7. Granite block relaid	100 s. y.	2.90	3.00	2.00
8. Sheet asphalt pavement	19,500 s. y.	1.38	1.35	1.40

DARKENED CONCRETE ROADWAY PAVEMENT, WASHINGTON, D. C.

OWNER: District Commissioners, Washington, D. C.

PROJECT: Approximately 2,650 sq.yd. of darkened concrete roadway pavement, concrete curbing, and gutter repairs on west roadway of South Capitol Street, between Howard Road and Portland Street, Washington, D. C.

CONDITIONS: Contractor to furnish all materials and complete project by August 1, 1944. Highway transportation facilities available to site of work. Wage rates specified are: skilled labor, $1.25 to $1.50 per hour; semi-skilled, 80c. to $1.00; and common labor, 75c.

BIDS: Five bids were received April 27, 1944, ranging from the contract low of $15,755 to $19,456.

LIST OF BIDDERS:

1. Wilmoth Paving Co., Washington, D. C. (contract)	$15,755
2. E. B. Donaldson & Brother, Washington, D. C	16,949
3. Donaldson Paving Co., Inc., Washington, D. C	17,553
4. Corson & Gruman Co., Washington, D. C	18,943
5. McGuire & Rolfe, Washington, D. C	19,456

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Bituminous surface course (CM-B)	10 ton	$10.00	$12.00	$9.00
2. Wire mesh reinforcement	3.000 s. y.	.25	.24	.27
3. Adjusting District manhole frames	5 ea.	5.00	3.00	5.00
4. Cutting blocks, cement roadway, sidewalks, etc	1,000 l. f.	.50	.40	.70
5. Borrow excavation	250 c. y.	1.00	1.00	2.00
6. Calcium chloride	100 lb.	.02	.03	.03
7. Cork expansion joint	100 l. f.	.50	.40	.80
8. Cement concrete pavement	5 c. y.	12.50	19.75	
9. Anchor bolts	350 ea.	.40	1.50	
10. Carbon emulsion	50 lb.	.10	.10	
11. Darkened cement concrete for roadway pavement	2,650 s. y.	3.75	4.40	
12. Darkened cem. conc. for curbway	5 c. y.	16.00	20.00	
13. Cement for curbing and gutter	2.250 l. f.	1.65	1.25	
14. ⅜-in. deformed tie rods	2,000 lb.	.07	.10	

HIGHWAY, FLORIDA

OWNER: Florida State Road Dept., Tallahassee.

PROJECT: Construction of 4.335 miles of 9-7-9-in. pl cement concrete pavement between Hammond Boulevard a Cassat Avenue, Jacksonville, Duval County, Fla. Inclu necessary clearing and grubbing; regular and ditch exca tion; removal of existing pavement; plain cement concr pavement; timber for structures; pipe culvert; cross drain side drains; underdrains; inlets and manholes; spriggin relaying brick pavement; concrete guard rail posts; a concrete ditch pavement.

CONDITIONS: Contractor to furnish all materials a complete work in 175 working days. Rail, highway a water transportation facilities available. Prevailing wag to be paid on project.

BIDS: Seven bids were received February 17, 1944, rangin from the low of $239.983 to $270,643.

LIST OF BIDDERS:

1. L. J. & W. L. Cobb, Inc., Tampa, Fla. (low bidder)	$239,9
2. Duval Engr. & Contr. Co., Jacksonville, Fla.	244,5
3. R. H. Wright & Son, Columbus, Ga.	245,2
4. M. J. Carroll Contr. Co., Leesburg, Fla.	250,9
5. Ivy H. Smith Co., Jacksonville, Fla.	258,0
6. S. B. Brinson, Tampa, Fla.	261,7
7. Espy Paving & Constr. Co., Savannah, Ga.	270,6

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Clearing and grubbing	59.97 ac.	$120.00	$90.00	$75
2. Regular excavation	40,352 c. y.	.43	.33	
3. Lateral ditch excavation	6,580 c. y.	.35	.40	
4. Remove exist. pavmt. (brick and mac. asph.)	940 s. y.	.50	.40	1.0
5. Overhaul	107,142 sta. c. y.	.02	.01	.0
6. Ocala rock base (single crse., 6-in. thick)	2,002 s. y.	1.50	1.40	1.0
7. Tar prime material, RT-2	400 gal.	.20	.20	.4
8. Cover material for Type 2	56 c. y.	7.50	8.00	8.0
9. Bituminous mat'l. (surf. trtmt.)	1,202 gal.	.20	.18	.4
10. Cement concrete pavement, plain (9–7–9-in.)	61.079 s. y.	2.76	2.97	2.7
11. Treated structural timber	8.47 Mbm.	225.00	200.00	200.0
12. Untreated structural timber	0.33 Mbm.	275.00	125.00	100.0
13. Concrete, Class A. (culverts)	298.63 c. y.	46.00	35.00	40.0
14. Concrete, Class A (headwalls)	16.92 c. y.	46.00	42.50	50.0
15. Concrete handrail	180 l. f.	1.40	5.00	3.0
16. Reinforcing steel	29,154 lb.	.06	.075	.1
17. Pipe culvert (conc. or vit. clay, 12-in. cross drain)	44 l. f.	1.50	2.50	1.00
18. Pipe culv. (conc. or v. c., 18-in. cross drain)	263 l. f.	2.25	3.25	2.50
19. Pipe culv. (conc. or v. c., 24-in. cross drain)	36 l. f.	3.25	4.00	3.50
20. Pipe culv. (conc. or v. c., 30-in. cross drain)	126 l. f.	4.75	5.50	4.50
21. Pipe culv. (conc. or v. c., 36-in. cross drain)	104 l. f.	6.50	6.50	5.50
22. Pipe culv. (conc. or v. c., 18-in. side drain)	351 l. f.	2.25	3.25	2.25
23. As above, 24-in. side drain	42 l. f.	3.25	4.00	3.25
24. Relay exist. cross drain pipe (24-in. conc.)	46 l. f.	1.75	4.00	2.25
25. As above, 36-in. concrete	43 l. f.	3.00	5.00	3.50
26. As above, 48-in. corr. metal pipe	20 l. f.	5.00	6.00	7.00
27. Relay exist. side drain pipe, 18-in. conc.	508 l. f.	1.50	3.50	1.25
28. As above, 24-in. concrete	25 l. f.	1.75	4.00	1.50
29. Underdrain (6-in. pipe)	522 l. f.	1.25	1.00	3.00
30. Inlet, Type C (0 to 4-ft. deep)	2 ea.	110.00	175.00	250.00
31. Inlet, Type E (4 to 6-ft. deep) no grate	1 ea.	140.00	200.00	300.00
32. Manhole, Type B (4 to 6-ft. deep, no. c. i. ring or cover)	1 ea.	125.00	150.00	300.00
33. Sprigging	167,000 s. y.	.0275	.03	.06
34. Relay brick pavement	207 s. y.	2.00	1.50	3.50
35. Guard rail posts (concrete)	56 ea.	6.00	5.00	5.00
36. Conc. ditch pavement (4-in. thick)	4,797 s. y.	1.90	1.50	2.25

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Association Elections and Activities

John Nicholson, of Nicholson Galloway, roofing contractors, New York, was recently elected treasurer of the New York chapter of the North Sea Mine Force Association, a group of U. S. Navy men who in the first World War transported, assembled, planted and swept mines the North Sea. Mr. Nicholson was prime mover in the organization of New York and vicinity veterans of mine force.

The recently organized Carolin Road Builders Association with offic at 613 Commercial Bank Bldg., Raleig N. C., elected the following officers Nello L. Teer, Jr., Durham, N. C president; E. H. Hines, Greenwoo S. C., vice-president; Warren J. Mann Raleigh, N. C., secretary-treasurer an business manager F. D. Cline, Raleig N. C., W. E. Graham, Cleveland, N. C J. R. Suber, Whitemire, S. C., and T R. McMeekin, Cheraw, S. C., constitut the board of governors.

E. D. Burchard of Raleigh, N. C., i president of the North Carolina Societ of Engineers. Other officers are L. W Paine of Raleigh, vice president; R. B Rice of Raleigh, secretary and treas urer and W. Vance Baise of Raleigh B. A. Waldermaier of Cherry Point, N C., R. P. Reece of Winston-Salem, N C., and E. P. Cole of Charlotte, N. C. directors.

Officers of the Illinois Contractors Association are: president, C. J. Noritz, Effingham, Ill.; vice president, Henry Berenz, Bloomington, Ill.; treasurer, Thos. H. Joyce, Jr., Springfield, Ill.; directors—H. H. Gunther, Galesburg, Ill., and Jas. F. Keeley, East St. Louis, Ill.

The Durham, N. C. Engineers Club was organized May 15. M. W. Piatt, consulting engineer, was elected president, C. D. Faucette, vice president, Guy H. Bennett, secretary and T. C. Cooke, treasurer. Forty-six engineers from Durham and vicinity attended the first meeting.

C. M. Greer, chief of design section of the U. S. Engineers, Little Rock, Ark., district, has been elected presi-t of the Little Rock Engineers Club. ers elected were: Werner Knoop, e president, and Leonard Caldwell, retary-treasurer.

Edgar T. Brown, city engineer of Fay-eville, Ark., is chairman of the Ar-sas Water and Sewerage Associa-. M. C. Turner, Conway, is vice-airman and Harrison Hale, of the iversity of Arkansas, is secretary.

J. Andre Fouilhoux was reelected sident of the New York Building gress, Inc., recently. Other officers : vice presidents, Robert H. Arm-ng, John J. Brennan, Louis Skid-re, Bernard B. Smith, J. A. Turner; retary, J. W. Taussig; Treasurer, C. orge Dandrow; and chairman of the ance committee, Carlton Proctor.

J. P. Colbert, associate professor of echanical Engineering at the Univer-y of Nebraska, has been elected presi-t of the Nebraska Engineering So-ty. Other officers are Clarence W. al, Omaha, vice president; J. S. ackman, Lincoln, secretary-treasurer; d H. G. Schlitt, Lincoln, and B. Man-ester, Omaha, directors.

The Engineering Professions Club Jacksonville, Fla., recently elected e following officers to serve a six-onths term; Conrad G. Easterday, esident; D. O. Foshee, vice-president; d R. Taylor, Secretary; J. G. Thor-erson, treasurer; and Allen Poppell, ogram director.

G. T. McCormick has been elected esident of the Milwaukee, Wis., sec-on of the Association of Municipal ngineers. Other officers are: Vice esident, Andrew L. Wapp; treasurer, dward R. Colberg, and secretary, Ed-ard F. Petersik.

Claiborne Perrilliat is president of e New Orleans chapter of the Associ-ted General Contractors of America, nc. Other officers are B. H. Grehan, ice-president; J. A. Haase, Jr., treas-rer, and L. J. Woodworth, secretary.

The induction of the Wisconsin So-iety of Professional Engineers into the ational society took place in Milwau-ee on May 26—the third such state roup to join in the last year. The fficers of the Wisconsin society are: Morton O. Withey, president; William . Urban and Edwin W. Seeger, vice residents; O. J. Muegge, secretary; nd L. M. Schlindler, treasurer. The di-ectors are: William D. Bliss, Ernest zekely, Hans P. Dahlstrand, and Walter A. Peirce. Lawrence E. Peter-on is national representative, and Ben . Elliott, alternate.

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Then he said to himself

"THEY CAN NEVER BOMB THIS PLACE"

WITH 300 pound vehemence, Reich-Marshal Hermann Goering once impressed the heilers and the heiled in Berlin with this guarantee:

"THEY CAN NEVER BOMB THIS PLACE"

He was not trying to mislead.

Give him credit . . . he had figured it out as any business man would:

(a) He figured what his competition had

(b) He figured what he had

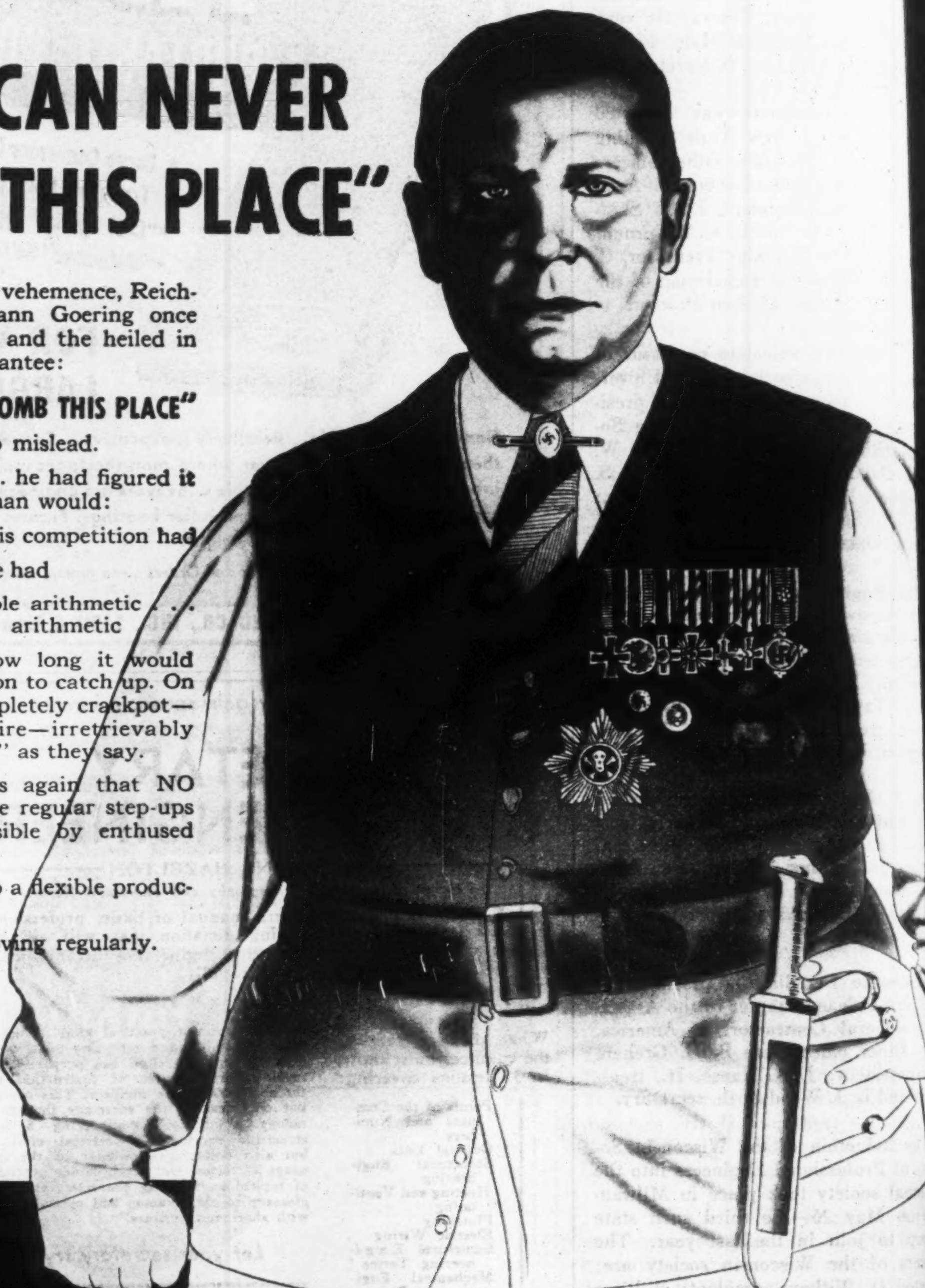
The answer was simple arithmetic . . . then, departing from arithmetic

(c) He *estimated* how long it would take his competition to catch up. On *that* he went completely crackpot—unalterably haywire—irretrievably "losing his market" as they say.

And that just proves again that NO ONE can estimate the regular step-ups in output made possible by enthused producers

. . . having recourse to a flexible production technique

. . . that keeps improving regularly.



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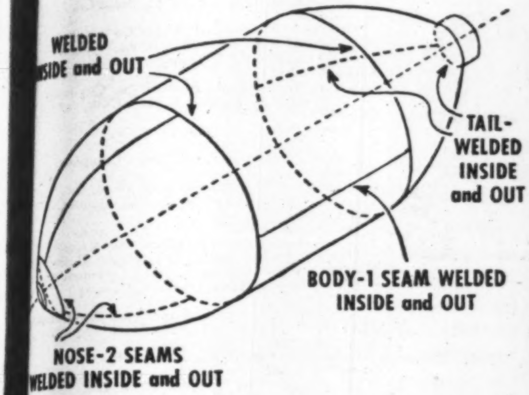
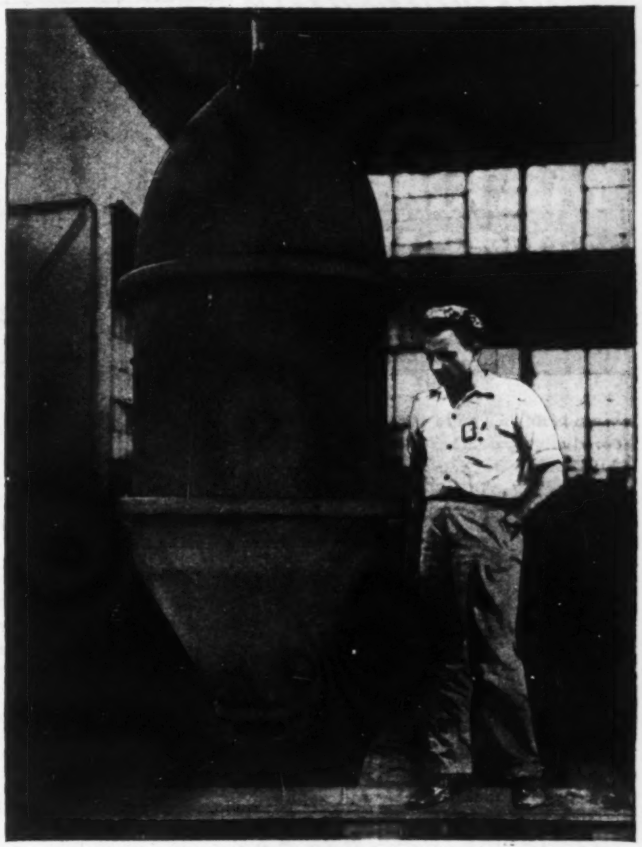
Listen Hermann, Never say NEVER!


WELDED
SIDE and OUT
TAIL-
WELDED
INSIDE
and OUT
BODY-1 SEAM WELDED
INSIDE and OUT
NOSE-2 SEAMS
WELDED INSIDE and OUT



4000-lb. blockbuster, welded as shown in sketch. Its production has been increased by improved arc welding technique:

You're too cagey a rascal *not* to have figured that *recourse* to Arc Welding would speed America's war output. So you estimated that step up at, say, 25%.

But as it turned out, production of Berlin-busters, ships, planes, tanks and guns was stepped up another 25% and then other 25%'s by added recourses applied AFTER your "NO BOMBING" assurance.

And now, the knockout blow

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recourse to which gives additional step-ups in welding production of 25% . . . 50% . . . 100% . . . and more.

This arc welding technique, developed by Lincoln Engineers, uses arc *force* to get deeper penetration and higher welding speed for all types of joints in mild steel plate, shapes and sheet. Procedure manual with full details will be sent free to engineers and production supervisors.

There is a Lincoln Engineer near-by to assist you in applying the "Fleet-welding" Technique to war production and postwar planning. Call him or write:

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America's greatest natural **recourse**

ARC WELDING

Streamlined for

MAXIMUM DIGGING EFFICIENCY

Field tests on a wide variety of jobs have conclusively demonstrated that Johnson All-Welded Buckets dig faster... bring up a bigger payload with every bite.

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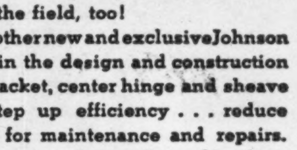
Many other new and exclusive Johnson features in the design and construction of arm bracket, center hinge and sheave blocks step up efficiency . . . reduce time out for maintenance and repairs.

Three types: Rehandling, ½ yd. to 2½ yds.; General Purpose, ½ yd. to 2 yds.; Heavy Digging, ½ yd. to 1½ yds. ***General Purpose Type available for immediate delivery.***



The C. S. Johnson Company
Champaign, Illinois

MEN AND JOBS

Lt. Comdr. Russell C. Brinker, until recently Public Works Officer, Civil Engineer Corps, at the Naval Advance Base Depot, Davisville, R. I., is now stationed in the Pacific. Comdr. Brinker, who holds degrees from the Lafayette College and the University of Minnesota, before joining the U. S. Navy, taught at Worcester Polytechnic Institute, the University of Minnesota, and the University of Hawaii, his last position before naval service being assistant professor of structural engineering at Minnesota.

George F. Nicholson, former chief engineer of the Port of Seattle and later engineer for Los Angeles Harbor, was promoted recently from the rank of commander to captain in San Francisco where he is in charge of important naval construction work. He has acted as consultant for ports in Mexico and Europe, as well as the United States, and is credited with drafting plans for the ports of Queenstown and Cork, Ireland.

Promotion of **Lieut. Col. Garner W. Miller,** U. S. District Engineer at Memphis, Tenn., to colonel, Corps of Engineers, has been announced. Col. Miller has been associated with the Memphis district since 1930, and assumed command last October at the time of the retirement of his predecessor, Col. Jarvis Bain. He is a graduate of Purdue University. In addition to important flood control projects the Memphis district under Col. Miller has under way preliminary work for the new Mississippi River bridge at Memphis.

Ray R. Swann, highway engineer in the state divisional office at Madison, has been elected highway commissioner of Dane County, Wis. He succeeds **Oden J. Hanson,** who resigned June 1, after serving since 1940.

Lt. Comdr Robert Hiles, formerly civilian engineer with the Navy Bureau of Yards and Docks at Washington, has been made head of the public work department of a naval air station in Texas. He made the erection drawings for the approaches of the $20,000,000 bridge over the Mississippi River at Baton Rouge, La.

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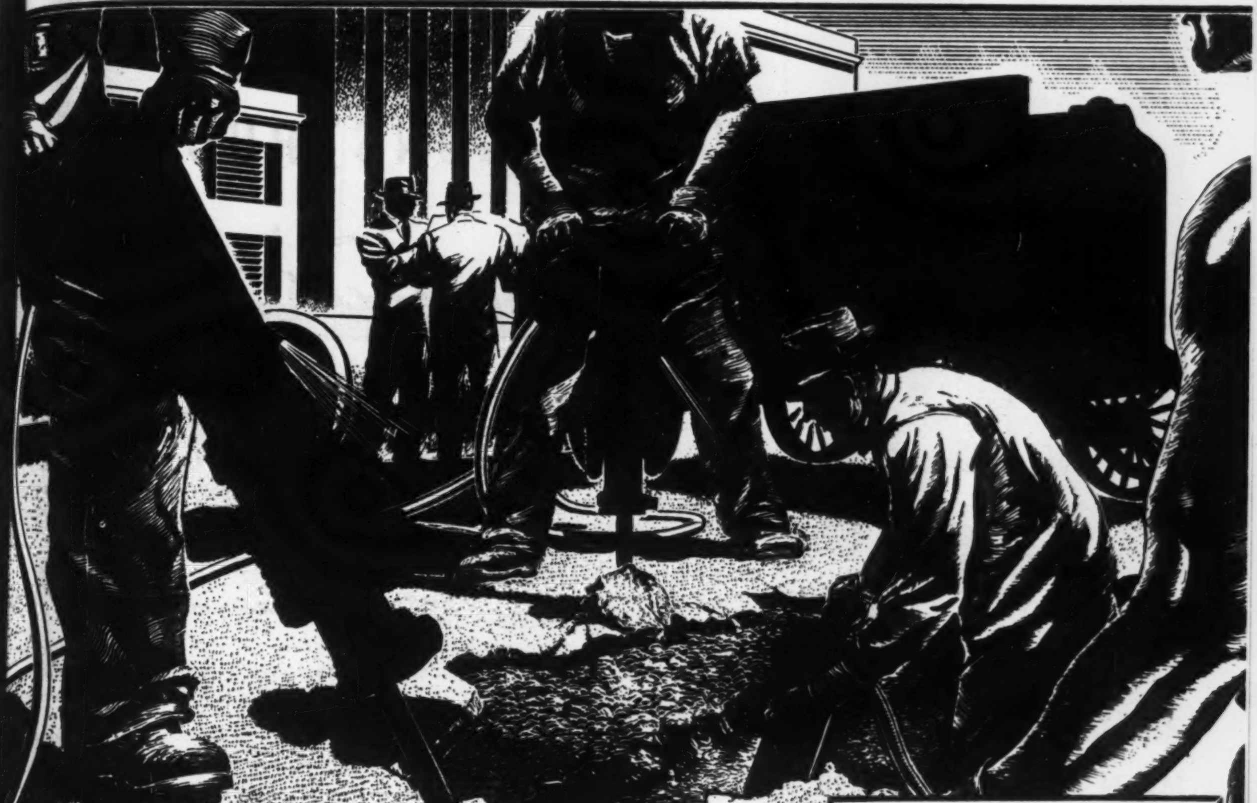

CITIES now making plans for postwar improvements will be using Blue Brute airpower all along the line. You'll find Worthington compressors and air tools good to back your bid on jobs like this: *Milwaukee's 6-year program of improvement including a $22,248,093 expenditure for new bridges, sewers, buildings, street widenings and extensions.*

Other cities' plans have also gone beyond the "proposal" stage. New housing projects and streets, involving new trenches for gas mains and electric cable laying — new bridges and sewers — will go forward faster, more economically, with easier-breathing Blue Brute compressors on the job.

Available in all mountings . . . Diesel, gasoline or electric driven . . . Blue Brutes with Feather Valves* stay on the job longer without costly repairs, delays. Full force feed lubrication fights wear; 3-point suspension of engine and compressor cushions shock and vibration. Investigate *all* Blue Brute features now!

Then team 'em up with rugged, easy-handling, air-saving Blue Brute Air Tools . . . like the breakers shown above. You'll have a power team, sturdy and trouble-free for years to come!

Behind the Fighting Fronts

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BLUE BRUTES

Shell-blasted mountain highways in Italy have been repaired with Blue Brute** assistance. In hundreds of war plants here at home . . . Navy Yards, air bases . . . Blue Brutes are at work. Your nearest distributor is listed on page 120.

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*Reg. U. S. Pat. Off. **Blue Brute Compressors and Air Tools are painted olive drab for the Army.

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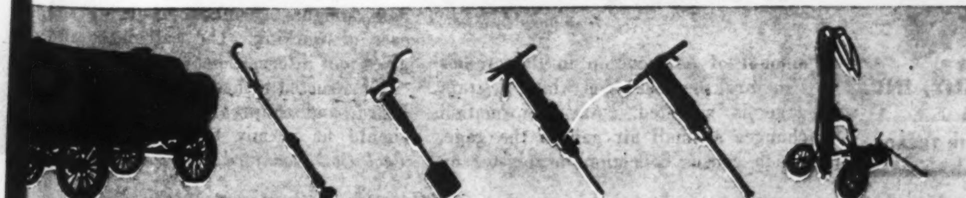

pressors from 60 to 500 cu. ft. capacity in mount- to suit all jobs. Rock Drills and Air Tools that have always set the pace for easy operation — available in a wide range of weights and sizes.

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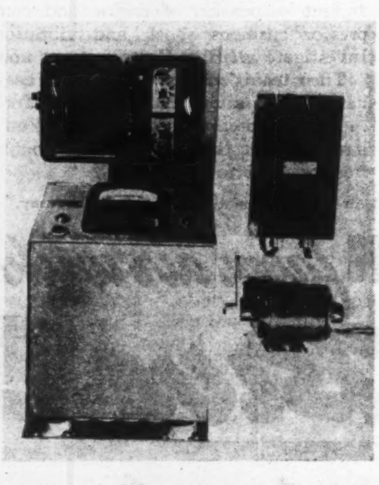
Prefabricated Conduit

Featuring a time-saving and easily operated drive coupler, Ric-Wil insulated, prefabricated pipe conduit is available in 21-ft. sections. It is completely prefabricated, with pipe or pipes, insulation and aligning pipe supports. When this conduit, adaptable to underground, surface or overhead insulation, is coupled, an asphalt blanket, applied with heat over the entire closure area, fuses with factory-applied asphalt and assures uniform protection.

The drive coupler, which does not require skilled workmen to apply it, may be used for mechanical or welded closure.—*The Ric-Wil Co., 1572 Union Commerce Bldg., Cleveland, Ohio.*

• • •

Crane-Stability Gage



Intended specifically to safeguard boom-type cranes, a new crane-stability gage is said to eliminate dependence on the operator's judgment and to permit maximum use of the crane. The gage measures the tipping moment or degree of crane stability by determining the amount of deformation in the crane's structural member upon which a strain gage is mounted. Any deformation changes a small air gap in the gage, which causes deflection to register on the indicating unit.

The complete gage consists of strain gage, balancing unit, indicating unit, constant-voltage transformer, and a boom-angle compensator. — *General Electric Co., Special Products Division, Schenectady, N. Y.*

• • •

Lens-Cleaning System

To keep goggles and all types of industrial lenses clean and free from fog, grease, etc., a new lens-cleaning system includes both hermetically sealed ampoules of Brite-Ize concentrate and "cleaning-station dispensers."

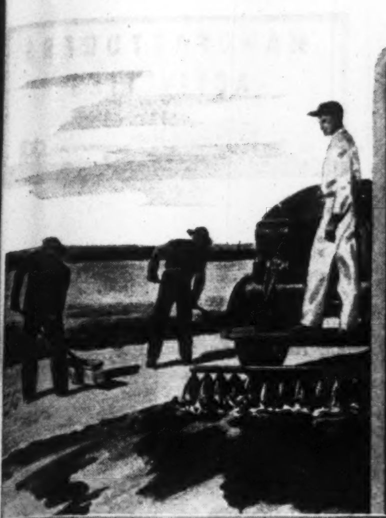
The dispensers are of air-charged pressure type; the lever releases the concentrate in a fine mist spray. Self-contained, they can be set on any shelf or attached to any pillar adjacent to work areas.—*The Brite-Ize Co., 1218 Pratt Blvd., Chicago 26, Ill.*

• • •

Woodwork Calculator

Available to all wood workers, a new problem-solving calculator may be obtained for 10 cents. The operation is simple: dial adjustment converts linear to board feet; determines slope per foot in degrees; finds comparative hardness, weights, shrinkage, warping and ease of working. The calculator also gives tool information.

Constructed of heavy varnished cardboard, and soilproof, this 6-in. device should fit in any tool kit.—*Greenlee Tool Co., Rockford, Ill.*



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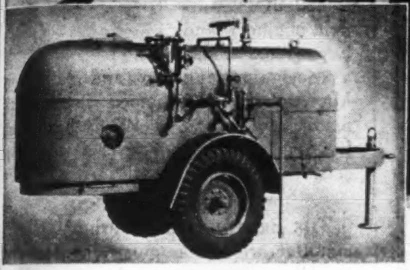
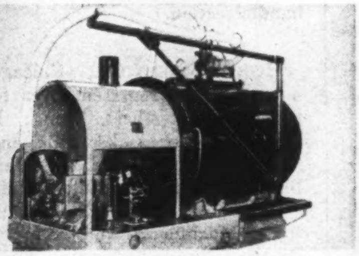


Mobile tank-car heater available in two and three tank-car sizes. Oil-fired with exclusive design four-pass flue travel; dry-coil steam condensate return under pressure — no water or heat loss.



Portable pumping booster. Heats by direct firing in one operation loading directly to distributor, relay truck or returning to tank-car. Available in 2 sizes—truck mounting or 4 wheel trailer.

Truck mounted pumping booster in service of Oklahoma Bituminous Distributing Co., Ada, Okla.

☆ Most of the pioneer models of tank-car heaters, built by Cleaver-Brooks fourteen years ago, are still in service.

☆ There are more Cleaver-Brooks tank-car heaters and bituminous boosters in both civilian and military service than all other makes of similar equipment combined.

☆ Service records from hundreds of owners prove Cleaver-Brooks dependability and durability. Cleaver-Brooks equipment is usually assigned to the difficult jobs — the hardest chores—because of its known capacity and reliability.

☆ The design and construction of Cleaver-Brooks heating equipment is subject to constant check — to include every feature that contributes to the most effective performance and long service life.

☆ Cleaver-Brooks heaters are the "finished" product of the pioneers and originators of tank-car heaters and bituminous boosters—built by specialists in the construction of portable and stationary steam generators for construction, industrial and military uses.

On your next bituminous heating equipment purchase you can expect and get more from Cleaver-Brooks—qualified by experience and facilities in this specialized field.

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You gain speed through the easy handling, strong leverage and straight-line application of power on LOWELL REVERSIBLE RATCHET WRENCHES.

The improved new types of LOWELL WRENCHES are the result of more than 70 years experience and development—1869 to 1944. They are made in a wide range of types and sizes for all classes of heavy construction, erection and maintenance.

Have patience with your dealer if he is unable to furnish all of the numerous LOWELL types and sizes, for we are engaged, for the duration, in supplying the needs of our Armed Forces.

See how each pawl, when engaged, transmits leverage from the solid stock of the handle, direct to the gear, in a straight line and with a "square" contact. The pawl is in COMPRESSION ONLY—no shear, no tension, no torsion. The shipper carries NONE of the load. This strong construction insures steady service.

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FLEXIBLE SHAFT VIBRATORS

. . . are the choice of those who want JACKSON standards of quality, dependability and performance. No other flexible shaft vibrator can offer such assurance.

Supplied with a 2⅜" and a 1¾" head. These two heads give user a vibrator efficient in and suitable for a wide range of applications. For instance, from wall sections of comparatively large size to narrow sections.

Model FS-6A, illustrated above, is furnished complete with 7, 14, 21 or 28 feet of shaft. Has dirt-proof turntable base. Supplied with or without wheelbarrow mounting.

Write, wire or telephone for further information

ELECTRIC TAMPER & EQUIPMENT CO.

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MANUFACTURERS' ACTIVITIES

Harold A. Anderson is now eastern district manager of the Austin Co., engineers and builders, succeeding J. K. Gannett, vice president, now director of engineering. Originally attached to the eastern district, which he joined in 1928 as field engineer, and having served also as designing engineer and estimator, Mr. Anderson was named district estimator at Chicago in 1939. Lately he has been in charge of several war projects.

The Bristol Co., Waterbury, Conn., manufacturers of automatic control and recording instruments, has opened a branch office in the Citizens State Bank Building, Houston, Tex. It will serve Louisiana and Texas, except the Panhandle section.

Caine Steel Co., Chicago, announces these representatives for corrugated steel sheet piling: Florida Equipment Co., Jacksonville, and Hart Machinery Co., Tampa, Fla.; James W. Bell, Cedar Rapids, Ia.; Bublitz Machinery Co., Kansas City, Mo.; Interstate Machinery and Supply Co., Omaha, Neb.; Industrial Equipment Co,. Sumter, S. C.; Bemiss Equipment Co., Richmond, Va., and Kane Tractor and Equipment Co., Winnipeg, Man.

A. M. **Guthrie** has been appointed field sales manager of The Buckeye Traction Ditcher Co., Findlay, Ohio. He will be in charge of distributor policies and appointments through district managers. Mr. Guthrie had been Buckeye's eastern district manager at Philadelphia, Pa., since January, 1940. Prior to joining the company he was associated with the Paul Cochran Equipment Co. in Chicago, and before that with the R-B Equipment Manufacturing Co. of Royal Oak, Mich.

THE G.I. SHOVEL WITH THE HIGH I.Q.

This Buckeye equipment will save on your post-war jobs!

Buckeye "Centro-lif" Bulldozers and Trailbuilders, Cable Control Units and other Tractor Equipment, Spreaders, Trenchers, Road Wideners, R-B Power Finegraders.

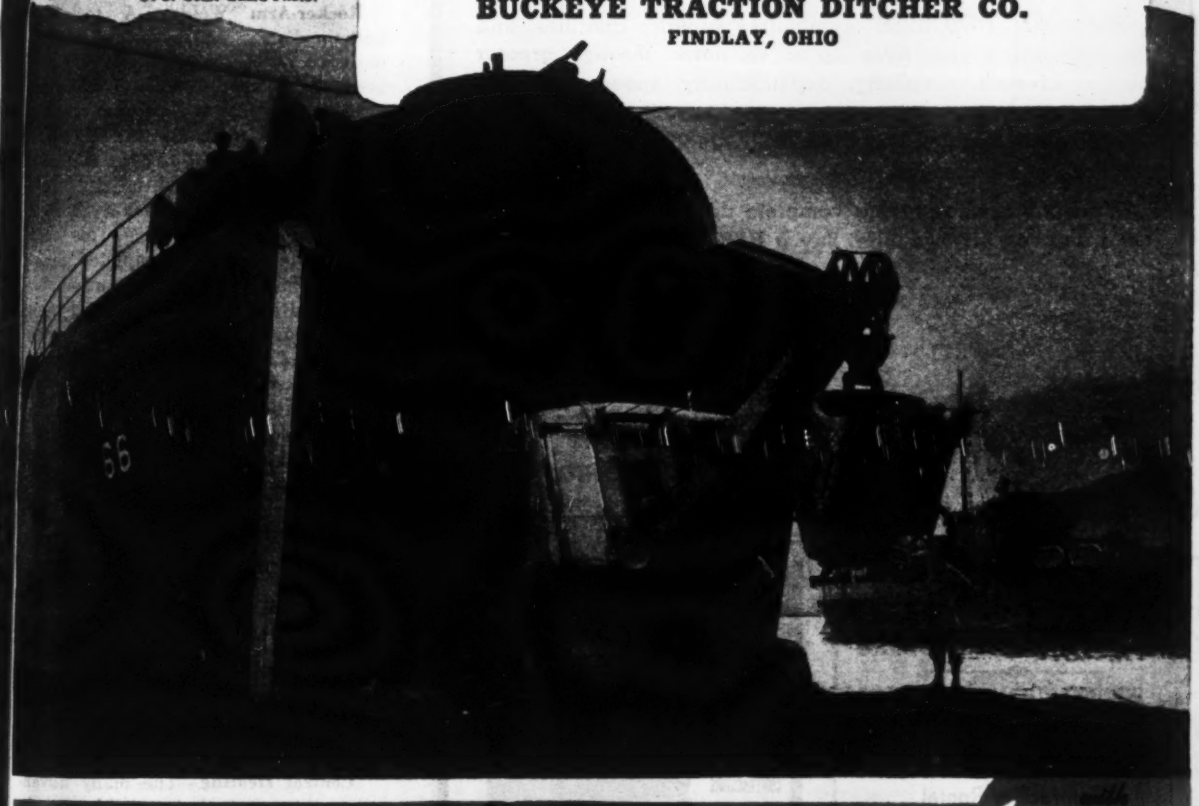
American construction equipment has become a potent weapon; is giving a good account of itself on every front. As always, some pieces of equipment are giving outstanding performance, and the Buckeye Clipper is one of them. The U. S. Army does not endorse any product—plays no favorites—which is fair all around. But men in the service, from our town and elsewhere, former shovel operators and even some of our employees in the service overseas, tell us what a swell job Clippers are doing. We quote:

> "You don't need a high I.Q. to run this G.I. shovel—it practically runs itself. Vacuum power control sure makes it easy to handle. It's easy to maintain, too. The guy who designed it sure felt for the 'Joes' on the maintenance end."

Well said, soldier! The trickle of Clipper repair parts going to operational bases bears out that last statement. Clippers are getting more abuse at the "fronts" than they ever got on construction jobs, in clay and gravel pits or in material yards, but they can take it.

We've had to put off a lot of people who wanted Clippers—war comes first. Those who are able to wait will find Clippers worth waiting for.

BUCKEYE TRACTION DITCHER CO.
FINDLAY, OHIO


U. S. Coast Guard Photo.

Buckeye Clippers

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with exclusive
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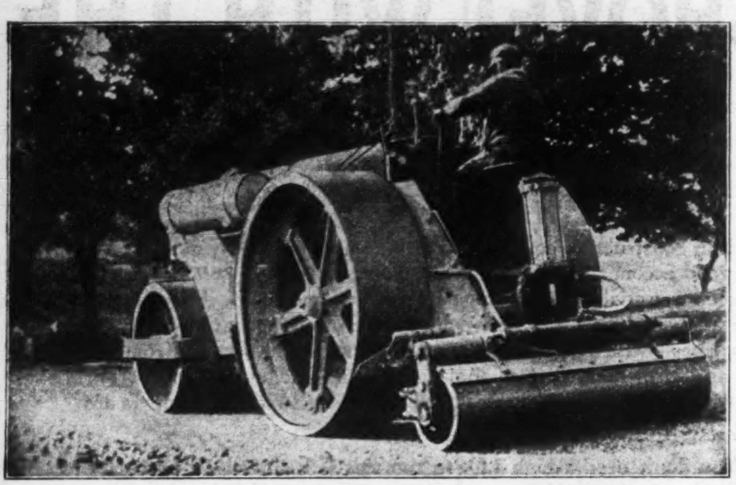

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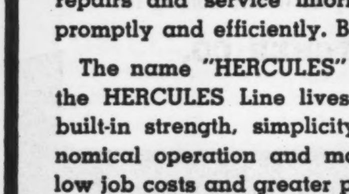

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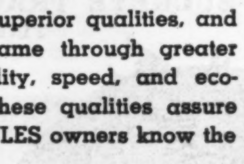

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NEW TRADE PUBLICATIONS

Tire Tips—This booklet lists 16 ways to increase tire mileage, lower costs and conserve rubber. It is valuable for any truck owner or user.—*The Diamond Rubber Co., Akron, Ohio.*

Gate Valves and Hydrants—Two catalogs of importance for all waterworks engineers and builders, and for fire departments. It is put out by an 87-year old manufacturing company.—*Mueller Co., Chattanooga, Tenn.*

Hydraulic Dredges—A 20-page hydraulic dredge catalogue has been published containing detailed information and specifications which will greatly help in solving dredge problems—*Joshua Hendy Iron Works, Sunnyvale, Calif.*

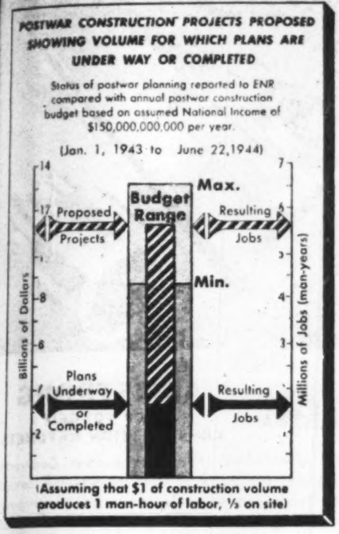
Rocker-Arm Welder—A technical bulletin describes a rocker-arm welder designed for making between 500 and 1000 sound spot welds per hour on structural sections of aluminum ranging up to ⅛ in. thicknesses of 24-ST.—*Progressive Welder Co., 3050 E. Outer Drive, Detroit 12, Mich.*

Contract Termination —This company having recently completed in 59 days its first contract termination, believes that since the method used by it in executing this termination has proved satisfactory, accomplishing the desired result in a short time, it is a good idea to send out copies of the file illustrating the procedure employed with vendors. It would appear that development of standard termination practices would tend to expedite negotiations. This material may help—*R. G. Le Tourneau, Inc., Peoria, Ill.*

Aquatic Weed Control—This 16-page booklet outlines by word and picture the methods of application of an aquatic weed control preparation for which the manufacturer claims effective results.—*Cloroben Corp., Jersey City 2, N. J.*

Central Heating—The many advantages of incorporating central heating in post-war community or group planning are outlined in a 6-page folder illustrating many typical installations of insulated underground conduits.—*Ric-wiL Co., 1572 Union Commerce Bldg., Cleveland, Ohio.*

POSTWAR PROJECTS



Projects proposed for postwar construction have been published in these columns since January, 1943 as they have been reported to ENGINEERING NEWS-RECORD.

The chart above shows, both in estimated dollar volume and in jobs or man-years of labor, how fast this reservoir of future work is filling up.

WATER SUPPLY

New York—Dpt. P. Wks., State Office Bldg., Albany, plans underway Proj. No. CON-5, water sys. and power lines in Chenango Valley State Park, Broome Co., for Central New York State Park Comn., Conservation Dpt. **$23,000.** Barker & Wheeler, 36 State St., Albany, consult. engrs.

N. Y., Binghamton—Dpt. P. Wks., State Office Bldg., Albany, plans 95% completed, Proj. No. MH-52, water supply, incl. reservoir, pump house and pumps at Binghamton State Hospital, for Dpt. Mental Hygiene, State Office Bldg., Albany. **$50,000.** Div. Construction. C. J. White, comr., Architecture, State Office Bldg., Albany, engr. CD 12/27—ENR 1/13.

N. Y., Cazenovia—Village, water filtration plant, storage tank. **$75,000.** State Aid Planning Funds allotted.

N. Y., Clifton Springs—Village of Clifton Springs, development auxiliary water supply, **$50,000.** State Aid Planning Funds allotted.

N. Y., Johnstown—City, reconstructing WW, **$18,000.** State Aid Planning Funds allotted.

★**N. Y., New York**—Bd. Water Supply, 120 Wall St., Zone 5, plans completed first stage, Delaware Aqueduct Proj., incl. Neversink Dam, **$31,000,000;** plans 70% completed second stage, Delaware Aqueduct Proj., **$75,000,000.** C. M. Clark, ch. engr.

SEWERS, WASTE DISPOSAL

New York—Dpt. P. Wks., State Office Bldg., Albany, plans underway Proj. No. CON-15, sewage disposal plant at Jones Beach State Park, Nassau Co., for Long Island State Park Comn., Conservation Dpt. **$250,000.**

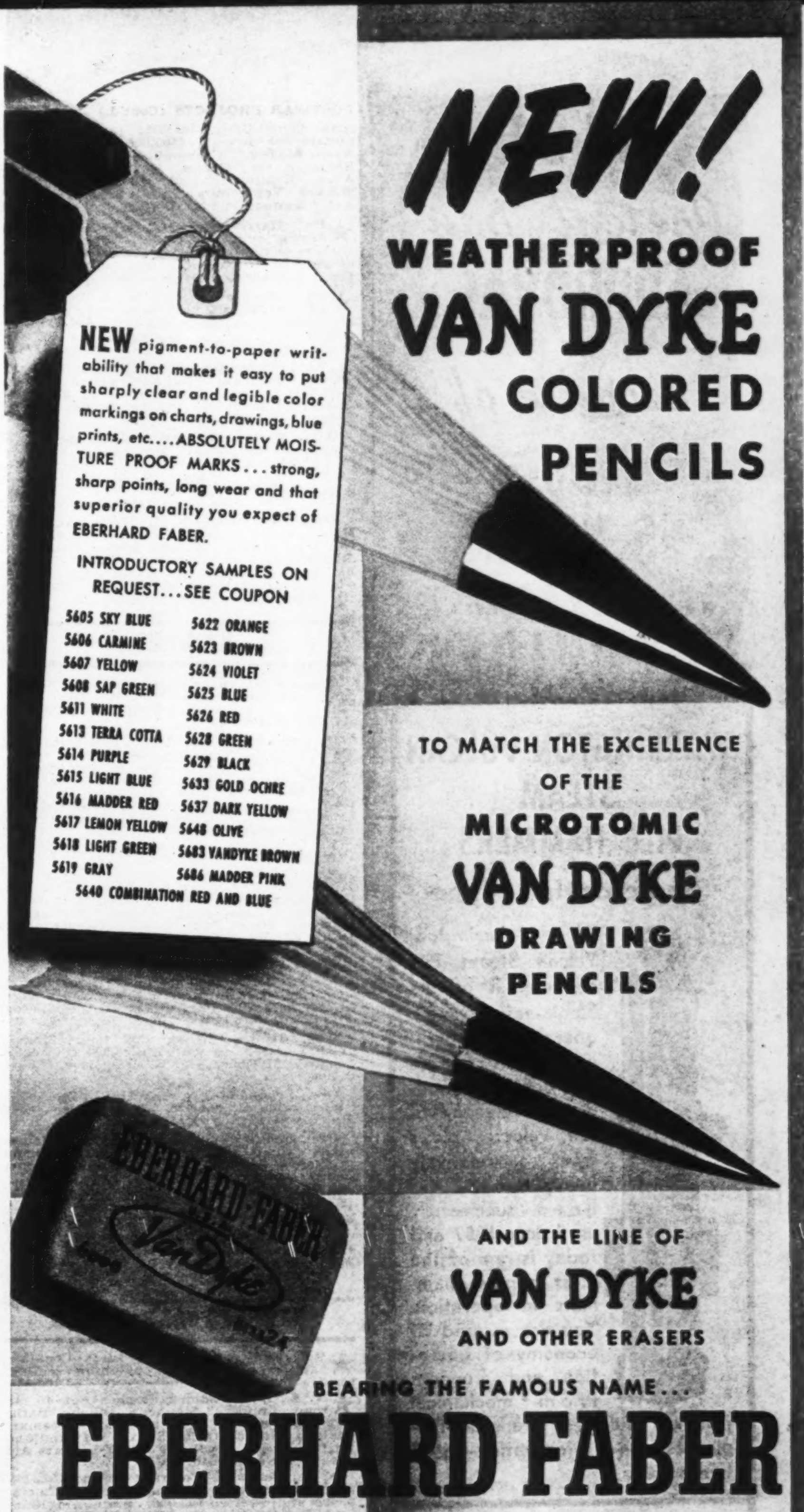
N. Y., Cazenovia—Village, sewage disposal plant and trunk sewer connection. **$50,000.** State Aid Planning Funds allotted.

N. Y., Lawrencce—Village, sewers. **$276,085.** State Aid Planning Funds allotted.

N. Y., Norwich—City, sewer extens., sewage disposal plant. **$400,000.** State Aid Planning Funds allotted.

N. Y., Scarsdale—Village, reconstructing existing sanitary sewer lines, Brookline and Locust Lane Areas. **$39,000.** State Aid Planning Funds allotted.

★**N. Y., Yonkers**—City, combined sewer Aston Rd., **$100,000,** Culver St. **$110,000,** Cook Ave. **$39,000,** Bryn Mawr Knolls **$70,000,** Canfield Ave. **$132,200,** Bronx Hills **$172,600,**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5615 LIGHT BLUE	5633 GOLD OCHRE
5616 MADDER RED	5637 DARK YELLOW
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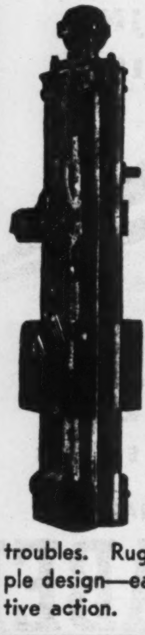

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POSTWAR PROJECTS (Cont'd.)

Alta Vista Drive **$62,000**; sanitary sewer Sunnybrook Area 1 **$505,000**, Central Park Ave. **$55,000**, Altamont Pl., Tioga and Staunton Sts., Teresa, Runyon and Crotty Aves., Kenilworth and Mile Square Rds., **$65,600**, Vredenburgh Ave. **$36,500**. State Aid Planning Funds allotted.

★**Pa., Harrisburg**—City, c/o R. M. Andrews, engr., receiving proposals from various engineering firms for estimated cost of sewage treatment plant and service of firm. **$2,100,000.** CD 5/9—ENR 5/18.

★**Wis., Manitowoc** — City, A. Post, clk., sewers, **$629,109** provisions made for raising money; garbage disposal, **$60,000**, no provisions made for raising money. E. F. Walter, city engr. CD 1/25/43—ENR 1/28/43.

★**Wis., Sheboygen**—City, H. Zehms, pres. Dpt. P. Wks., City Hall, storm sewers, **$400,000**; sewage disposal plant, **$100,000.** Provisions made for raising money. A. L. Boley, city engr.

Wis., West Allis—Metropolitan Sewerage Comn., Jones Island, Milwaukee, Zone 1, 27 in. vitr. clay main sanitary sewer in S. 84 St. from W. Walker St. to W. National Ave. **$130,000.** Jas. L. Ferebee, Jones Island, Milwaukee, Zone 1, ch. engr.

Wis., West Bend—K. L. Weiss, clk., City Hall., plans completed storm sewers, **$13,200**; sanitary sewers, **$9,750**; sewage digester, **$15,000**; garbage incinerator, **$30,000.** Financing incomplete. Suhr, Berryman Peterson & Suhr, Inc., 130 N. Wells St., Chicago, Ill., engrs. CD 2/10—ENR 2/24.

BRIDGES

Mass., Waltham—City P. Wks. Dpt., Waltham, rein.-con. bridge Elm St. Over **$25,000.** J. R. Worcester & Co., 79 Milk St., Boston, consult. engr.

Missouri—State Hy. Comn., Jefferson City, plans 90% complete one 80 ft. steel plate girder and two 20 ft. rein.-con. girder span bridge, concrete piers, abutments to rock over Little Pens Creek, road from Hannibal to St. Louis, Route 61, Proj. PW-FA 275-F 5; one 78 ft. and one 50 ft. I-beam span bridge, concrete piers and bents to rock over Pens Creek, on same road, Route 61, Proj. PW-FA 257-D2, both Pike Co.

New York—Dpt. P. Wks., State Office Bldg., Albany, plans underway Proj. No. CON-20, reconstructing foot bridges at Niagara Reservation, Niagara Co., for Niagara Frontier State Park Comn., Conservation Dpt. **$25,000.** Fretts, Tallamy, Senior & Forrestel, 5488 Main St., Williamsville, Buffalo, consult. engrs.

N. Y., Cortland—Comrs. Cortland Co., 2 new bridges in town of McGraw and village of Homer. **$65,000.** State Aid Planning Funds allotted.

Ore., Astoria—Clatsop Co., Court House, rebuild or replace with fills, 5,000 ft. trestle bridge. **$100,000.** A. F. Danielson, Court House, engr.

Ore., Lebanon—City, City Hall, plans completed bridges. **$60,000.** S. I. Stewart, City Hall, engr.

Ore., Medford—Jackson Co., Court House, plans completed constructing, repairing bridges. **$225,000.** P. B. Rynning, Court House, engr.

Ore., McMinnville—Yamhill Co., Court House, constructing, repairing bridges. **$50,450.** H. W. Herring, Court House, engr.

Ore., Tillamook — Tillamook Co., Court House, plans completed constructing, repairing bridges. **$100,000.** W. Stanley Coates, Court House, engr.

STREETS AND ROADS

★**Mo., Kansas City**—City, L. P. Cookingham, mgr., City Hall, patching, sealing, resurfacing and repaving streets. **$3,465,063.**

★**N. Y., Bath**—Comrs. Steuben Co., 45 mi. road imprvs., Stephens Gulch, Bath-Cameron-Jasper, Purdy Creek, Freeman, Elkland, Highup, Atlanta-East Wayland and Prattsburg-Pultney Rds., **$778,200.** State Aid Planning Funds allotted.

N. Y., Cortland—Comrs. Cortland Co., reconstructing roads in Blodgett Mills, Cincinnatus and Preble, **$93,000.** State Aid Planning Funds allotted. CD 5/22—ENR 6/1.

N. Y., Johnstown—City, 2¾ mi. main street paving, **$120,000.** State Aid Planning Funds allotted.

N. Y., Putnam Valley—Town, 6 mi. hys. **$150,000.** State Aid Planning Funds allotted.

N. Y., Solvay—Village, imprv. Pennock and Hazard Sts., street imprvs. between Hazard and Bacon Sts. **$48,400.** State Aid Planning Funds allotted.

N. Y., Westport—Town, 5½ mi. road. **$65,000.** State Aid Planning Funds allotted.

N. Y., Yorkville—Village, imprv. Myers and Dudley Aves. **$30,000.** State Aid Planning Funds allotted.

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POSTWAR PROJECTS (Cont'd.)

★Ore., LaGrande—Union Co., plans 2 completed, constructing, repairing roa **$1,888,105.** S. B. Morgan, Court House, en

Ore., The Dalles—Wasco Co., Court Hou road construction and repairs. $411,500. Fauerso, Court House, engr.

★**Tex., Houston**—City, street toppi **$900,000** addnl. cost. G. L. Fugate, C Hall, engr. CD 5/14/43—ENR 5/30/43.

Wis., DePere—City, H. Donet. clk., Ci Hall, plans and financing completed, stree **$19,900;** plans and financing incomple streets, **$27,495.** F. M. Charleswort Kaukauna, engr.

EARTHWORK, WATERWAYS

†Alabama—U. S. Eng., 21 St. and Virgin Ave. N.W., Wash. 25, D. C., modificatio existing project for Mobile Harbor, providin for (a) adoption existing channel throug Garrows Bend from Choctaw Point to Arlington pier with depth of 27 ft. width of 1 ft. with 2 turning basins of demensio specified in existing project (b) adoptio of channel being dredged an emergenc measure alongside Arlington pier from Mobile Bay channel to turning basin at inne end of Garrows Bend channel, with dept of 27 ft., width of 150 ft. (c) anchorag area 32 ft. deep, 200 ft. wide, approx. 2,0 ft. long on west side of Mobile Bay Chann at quarantine station on Sand Island b extend. present anchorage southward 500 f and northward to an intersection with Mobile River channel (d) channel 700 ft. wid in Mobile River from mouth to first bend 775 ft. wide through first bend and 600 f wide from there to Alabama State Dock Pier A, south and turning basin opposit the Alabama State docks approx. 2,500 f long, 800 ft. wide at lower end and 1,00 ft. wide at upper end, all to a depth of 3 ft. (e) channel 25 ft. deep and generall 500 ft. wide in Mobile River from highwa bridge to mouth of Chickasaw Creek, thenc 25 ft. deep, 250 ft. wide in Chickasaw Cree to point approx. 400 ft. below mouth o Shell Bayou, the project for Chickasa Creek with its connecting channel to b combined with project Mobile Harbor, **$475,000;** providing channel 7 ft. deep, 150 f wide from Mobile Bay to an anchorage whic will be 600x500 ft. in extent and 7 ft. dee north of Fort Gaines, channel 4 ft. dee 40 ft. wide from anchorage into Dauphi Island Bay, **$88,000;** imprv. Bayou Coden providing channel 4 ft. deep, 40 ft. wide extend from depth in bay to bridge at LaBelle Ave., Bayou Coden, **$6,880;** channel 9 ft. deep, 110 ft. wide from Mississippi Sound to highway bridge at town of Bayou La Batre, **$27,500.** CD 2/18—ENR 3/9.

†Alabama and Mississippi—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash. 25, D. C. modification existing project for Black Warrier, Warrier and Tombigbee Rivers providing for increased spillway capacity at Dam 1. **$115,000.**

Ark., Paragould—City, City Hall, drainage sys. **$46,700.**

★**†California**—Bureau Reclamation, Custom House, Denver, 2, Colo., plans completed Pine Flat Dam on Kings River, **$53,000,000;** Central Valley Project features include Arvin-Edison, **$10,000,000,** and Kern River, **$9,200,000,** both on Kern River; Farmington Reservoir on Little John Creek **$1,560,000;** Rollins Dam on Bear River, **$3,000,000;** Stockton on Calaveras River, **$1,931,000;** Jacksonville Reservoir on Tuolumne River, **$13,326,000;** New Melones Reservoir, Stanislaus River, **$22,256,000;** Success Reservoir, Tule River, **$3,500,000;** Terminus Reservoir, Kaweah River, **$4,600,000;** Yolo, on Cache-Putah Creeks **$20,800,000;** Solano, Sacramento River, **$10,100,000;** Bidwell Bar, Feather River, **$52,800,000;** Bullards Bar, Yuba River, **$32,000,000;** Iron Canyon on Sacramento River, **$31,000,000,** and table Mountain on Sacramento River, **$55,000,000,** under study; Clickipudi and miscellaneous, **$5,000,000.** CD 4/14—ENR 5/4.

★**†California**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., dredging suitable approaches to authorized 26 ft. and 35 ft. anchorage areas, San Diego Harbor, **$165,000;** widening main channel to general width of 350 ft. and width of 700 ft. just inside entrance for deepening New Port Channel to 15 ft. over a width varying up to 330 ft. and dredging 2 anchorage areas to depth of 20 ft., Newport Bay Harbor, **$514,000;** entrance channel 16 ft. deep through existing entrance to bay, protected by breakwater exten. south by west from Morrow rock and bay channels and basins, Morrow Bay, **$976,000;** channel depth of 8 ft. adjacent to Municipal Wharf 1 and for progressive construction of sand trap, Monterey Harbor, **$74,000;** protected entrance channel 200 ft. wide, 15 ft. deep, thence a channel 100 ft. wide, 15 ft. deep to southern extremity of project with flared widening to 200 ft. length of 400 ft. at southern end, the entrance channel to be protected by sheet pile jetties, Monterey Bay (Moss Landing), **$350,000;** existing project be modified to provide for channel 30 ft. deep, 500 ft. wide across San Bruno Shoal, for channel 30 ft. deep, 300 ft. wide, with addnl. width at bends

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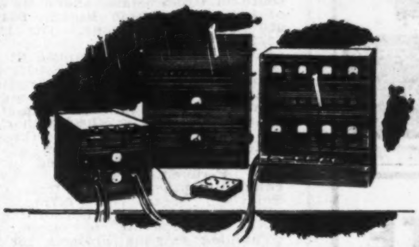

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POSTWAR PROJECTS (Cont'd.)

and flared entrance from deep water San Francisco Bay to vicinity of mouth Westpoint Slough in Redwood Creek, a for turning basin 30 ft. deep, 400 to 9 ft. wide and 2,200 ft. long at upper e of channel, Redwood Creek, **$48[illegible],000;** channel 600 to 800 ft. wide, 35 ft. deep fro deep water in San Francisco Bay at Yerba Buena Island to Army port and gener depot in Oakland outer harbor, incl. maintenance of 35 ft. depth in turning basin said depot, Oakland Harbor, **$17[illegible],000;** channel 150 ft. wide, 20 ft. deep at mean low low water, from deep water in San Pab Bay easterly along north side of Point Sa Pablo, Richmond Harbor, **$25,000;** two approach areas 20 ft. deep to within 50 ft. pierhead line adjacent to improved wate front at Vallejo and South Vallejo and fo maintenance of 2 approach areas to nav yard piers at southern end of Mare Island San Pablo Bay and Mare Island Strai Pinhole Shoal and Mare Island Chann and turning Basin, **$7,600;** rubble-moun breakwater exten. north-westerly about 1,10 ft. from south headland of Noyo Harbor **$600,000;** exten. breakwater along presen alinement for approx. 2,700 ft. to Roun Rock, Crescent City Harbor, **$1,610,000;** additional. imprv. for Crescent City Harbor providing construction breakwater exten. north westerly from Whaler Island to point approx. opposite Pelican Rock and remova pinnacle rocks and other material within protected area providing 12 ft. depth **$200,000.** CD 2/18—ENR 3/9.

★† **Connecticut**—U. S. Eng., 21 St. an Virginia Ave. N.W., Wash., 25, D. C. channel 125 ft. wide, 15 ft. deep from dee water in Fishers Island Sound to 2.4 mi in Mystic River, anchorage basin 8.5 acre 9 ft. deep north of Mason Island and turning basin about 500 ft. below highway bridge by widening channel to 200 ft. fo distance of 400 ft., Mystic River, **$34,00** ($14,000 local contribution); increasing width of channel opposite United States Submarine Base by average 350 ft., Thames River, **$120,000;** enlargement of entrance channel providing depth of 8 ft. and width of 100 ft. to upper end of wharves at Clinton, and provision anchorage area and turning basin of same depth, 600 ft. long by 150 to 250 ft. wide, Clinton Harbor, **$28,50** ($6,600 local contribution); entrance channel 100 ft. wide, 6 ft. deep from that depth in Long Island Sound to an anchorage basin of same depth, 200 ft. wide and 1,500 ft. long in East River, and branch channel in Sluice Creek 60 ft. wide, 6 ft. deep from entrance channel to Whitfield St., Guilfo Harbor, **$51,000** ($25,500 local contribution); harbor channel 30 ft. deep from Sound of Tomlinson Bridge with anchorage basins 30 ft. deep and 16 ft. deep, provided that imprv. for Quinnipiac River be not authorized, New Haven Harbor, **$1,673,000;** modification existing project for Bridgeport Harbor, eliminating present 12 ft. anchorage area and providing for main channel 30 ft. deep at mean low water and 400 ft. wide, from Long Island Sound to point beyond south end of East Main St. extended, thence decreasing in width to 250 ft. at point about 720 ft. below Stratford Avenue Bridge across Poquonock River, with widening at bend opposite Cilco Terminal to within 75 ft. of established harbor line, Bridgeport Harbor **$529,000;** channel 100 ft. wide, 6 ft. deep from that depth in Cos Cob Harbor at head of navigation at Boston Post Road, Mianus River, **$53,000;** northerly exten. existing 12 ft. channel for 450 ft. with widths of 100 to 140 ft. and anchorage areas west of present channel 8 ft. deep east and south of Grass Island and 6 ft. deep north of island, Greenwich Harbor, **$62,000** ($31,000 local contribution). CD 11/24—ENR 12/2.

★† **Florida**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., existing project for Fernandina Harbor and Amelia River be modified to reduce maximum width of turning basin from 1,000 to 800 ft., shifting the southerly channel line in this vicinity 50 ft. northwesterly and including authorized project at no addnl. cost the small area dredged by Rayonier, Inc., Fernandina Harbor; providing for channel depth of 34 ft. from Commodore Point to ocean, via Terminal Channel, widened to pierhead-bulkhead line, St. Johns River, Jacksonville to ocean, **$3,200,000;** combining existing projects for St. Johns River, Jacksonville to Palatka, Palatka to Lake Harney into single project for St. Johns River from Jacksonville to Lake Harney as recommended by Congress and further modified to provide for cut-off channel 5 ft. deep, 75 ft. wide between Lake Monroe and the vicinity of Osteen Bridge, **$25,500;** provide at Canaveral, a turning basin 27 ft. deep, 1,000 ft. wide with an average length of about 1,900 ft., located near easterly shore of Banana River and enclosed by a dike, entrance channel 27 ft. deep, 300 ft. wide by extend. from the turning basin to deep water in Canaveral Bight, protected at its seaward entrance by jetties to 12 ft. depth contour, barge canal 8 ft. deep, 100 ft. wide from turning basin to Intracoastal Waterway, and lock 50 ft. wide, 250 ft. long at suitable point on barge canal, Canaveral Harbor, **$1,661,000;** deepening present channel and turning basin to 25 ft. at mean low water, plus 1 foot over depth in turning basin and channel to station 65 plus 00 and 2 ft. overdepth seaward of this station, Lake Worth Inlet, OSTWAR PROJECTS (Cont'd.)

11,000; incorporating project for Miami iver and providing for widening mouth of iver by from 20 to 100 ft. for distance of 400 ft. to 15 ft. depth, channel 200 ft. ide, 15 ft. deep from mouth of river to unicipal turning basin, channel 8 ft. deep, 0 ft. wide from mouth of river to Intraoastal Waterway, thence 100 ft. wide to overnment Cut, channel 100 ft. wide, 12 deep from Miami River to harbor of efuge in Palmer Lake, Miami River, **$91,-**; modification existing project for Caoosahatchee River and Lake Okeechobee rainage areas to provide for channel 8 deep from Fort Myers to Intracoastal aterway near Stuart with widths of 90 from Fort Myers to Moore Haven, 80 in existing channel along southerly shore lake to hurricane gate structure at Clewiston, 100 ft. thence along relocated hannel to deep water on south side of ake, 100 ft. from deep water on east side f lake to St. Lucie Lock 2, thence 80 ft. o Intracoastal Waterway Caloosahatchee River and Lake Okeechobee Drainage areas, **206,000;** providing for Intracoastal Waterway from Caloosahatchee River to Withlacoochee River by imprv. section from Caloosahatchee River to Ancloti River to depth of 9 ft., width of 100 ft., incl. exsting projects for Sarasota Bay, Caseys Pass and channel from Clearwater Harbor through Boca Ciega Bay to Tampa Bay, **3,200,000;** widening Sparkman Channel from 300 to 400 ft., Ybor Channel from 400 to 500 ft., widening bend between Sparkman and Garrison Channels by cutting back the northeast corner Seddon Island by 250 ft. and cutting off resulting corners and reduction from 300 to 150 ft. of widening between Seddon and Garrison Channels authorized under existing project, all to depth of 30 ft., Tampa and Hillsboro Bays, **07,400;** exten., enlargement of existing channel upstream to form turning basin 6 ft. deep at Tarpon Springs, Anclote River, **$10,000;** channel 6 ft. deep, 100 ft. wide from 6 ft. depth in Gulf of Mexico, following line requiring the least rock excav. to and incl. basin 6 ft. deep, 200 ft. maximum width, 730 ft. long, immediately downstream from highway bridge at Port Richey, total length 3.2 mi., Pithlachascotee River, **$51,000;** channel in Watson Bayou 100 ft. wide, 10 ft. deep from depth in St. Andrews Bay to highway bridge in Panama City; providing channel 21 ft. deep, 100 ft. wide from that depth in Pensacola Bay to mouth of Bayou Chico, thence 20 ft. deep, 100 ft. wide in Bayou to point 4,400 ft. upstream from Escambia County Highway Bridge and for depth 20 ft. in existing turning basin and strengthened bridge piers, Pensacola Harbor, **$162,000.** CD 11/24 and 2/18—ENR 12/2 and 3/9.

†**Florida** and **Georgia**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., existing project for Intracoastal Waterway from Cape Fear River, N. C., to St. Johns River, Fla., be modified to provide for alternate route 9 ft. deep, 150 ft. wide in part of Frederica River, Ga., not now traversed by main route. CD 2/18—ENR 3/9.

†**Georgia**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., widening channel in vicinity of Atlantic Coast Line Railroad terminals to maximum of 550 ft. over length of 5,000 ft., and deepening turning basin and authorized channel above Seaboard Air Line bridge to 30 ft., Savannah Harbor, **$281,000;** modification existing project for Altamaha, Oconee and Ocmulgee Rivers, providing for removal of obstructions such as overhanging trees, drift, submerged stumps, snags and logs from Rifle Cut, Altamaha, Oconee and Ocmulgee Rivers. CD 2/18—ENR 3/9.

★†**Idaho, Washington** and **Oregon**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., complete canalization Snake River to Lewiston, Idaho, by constructing 10 locks and dams and open channel work between pools. **$58,625,000.** CD 2/10—ENR 3/9.

†**Illinois**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., providing for depth of 22 ft. from that depth in Lake Michigan to outer end of north pier, for abandonment present provision for dredging to 18 ft. depth the triangular area in southwest corner of inner basin, and imprv. anchorage area 8 ft. deep in southwest corner of inner basin, Waukegon Harbor, **$34,000.** CD 2/18—ENR 3/9.

★†**Illinois and Indiana**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., approach channel to harbor 28 ft. deep, 3,200 ft. wide through shoals outside breakwater and to close existing entrance gap between breakwaters, Calumet Harbor and River. **$910,000.**

★†**Iowa**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., adopt project for Missouri River between Sioux City and the mouth, distance of 795 mi., a channel 9 ft. deep, 300 ft. wide to be obtained by revetments, dikes, cut-offs, snagging, closing minor channels and some dredging, Missouri River between Sioux City and the mouth, **$6,000,000.** CD 2/18—ENR 3/9.

★†**Louisiana**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., modification existing project for Bayous LaLoutre, St. Malo and Ycloskey, providing for channel 5 ft. deep, 30 ft. wide in Bayou LaLoutre between Hopedale and Bayou St.

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POSTWAR PROJECTS (Cont'd.)

Malo, **$35,000**; imprv. channel betwe Baton Rouge and mouth of Mississippi provide following channel dimensions 35x5 ft. Baton Rouge to New Orleans, 35x1,50 ft. port limits of New Orleans, 40x1,000 f New Orleans to Head of Passes, 40x800 f Southwest Pass, 40x600 ft. Southwest Pa Bar Channel, 30x450 ft. South Pass, 30x60 ft. South Pass Bar Channel, Mississipp River, Baton Rouge, La., to Gulf of Mexic **$4,200,000**; providing alternate waterway an lock connection with Mississippi River vicinity of Algiers, Intracoastal Waterwa vicinity of Algiers at New Orleans, **$8, 000,000**; providing channel 9 ft. deep and ft. wide in Bayou Carlin and Bayou Pet Anse to Lake Peigneur, Bayous Petit Anse Tigre and Carlin, **$160,000**; modification existing project for Calcasieu River and Pas providing for channel 30 ft. deep, 250 f wide, suitably widened at bends, aroun Clooney Island, **$55,000.** CD 2/18—ENR 3/9

★ †**Maine**—U. S. Eng., 21 St. and Virgini Ave. N.W., Wash., 25, D. C., channel 7 ft. wide, 6 ft. deep at mean low water, an approx. 1,200 ft. long through shoal a easterly end of waterway, Isle Au Hau Thoroughfare, east of Penobscot Bay **$28,000**; enlargement entrance channel providing 9 ft. depths and 30 ft. width by removing rock ledge projections, Hendrick Harbor, Southport, **$6,000**; providing anchorage area 35 ft. deep and approx. 17 acres in area northwest of House Island Cisco Bay, Portland Harbor, **$780,000**; channel of Josias River from Perkins Cove providing 5 ft. depth and 40 ft. width t anchorage area, 5 ft. deep and 3.2 acres, i Flat Pond, Josias River (Ogunquit-Perkin Cove), Ogunquit **$64,000.** ($32,000 local contribution). CD 2/18—ENR 3/9.

★ †**Maryland**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., imprv., maintaining to 10 ft. depth existing small-boat harbor and approved channel, Susquehanna River, above and below Havre de Grace, **$18,000**; main channel project depth of 39 ft. from ocean through York Spit section and existing upper bay and Patapsco River channels to Fort McHenry, for addnl. anchorage 30 ft. deep, 2,400 ft. long, 1,200 ft. wide on northeast side of this channel and adjoining Riverview Anchorage on southeast, for a channel 27 ft. deep, 400 ft. wide from main channel at mouth of Patapsco River eastward to deep water in bay to serve as a cut-off channel to inland waterway from Delaware River to Chesapeake Bay and for channel 35 ft. deep, 200 ft. wide exten. from head of existing 35 ft. project channel in Curtis Bay southerly to point in Curtis Creek about 750 ft. north of Pennington Ave. Bridge, Baltimore Harbor and channels, **$2,388,000**; 22 ft. deep channel beginning at point on Curtis Creek about 640 ft. south of Baltimore & Ohio Railroad Bridge and exten. upstream to point about 1,200 ft. above mouth of Arundel Cove, channel to be 200 ft. wide in creek and 100 ft. wide leading to and in Arundel Cove, with turning basin 22 ft. deep, approx. 700 ft. square, near entrance to cove, Baltimore Harbor-Curtis Creek Channel, **$150,000**; channel 6 ft. deep through bar at mouth, Mill Creek, **$4,200**; channel 6 ft. deep, 100 ft. wide from that depth in Chesapeake Bay to mouth of creek with jetty protection, thence 6 ft. deep, 60 ft. wide, 2,600 ft. long to turning basin 6 ft. deep and 120 ft. square in Broadwater Creek, Broadwater Creek, **$60,000** ($30,000 local contribution); entrance channel 100 ft. wide, 6 ft. deep across bar at mouth of creek, Cadle Creek, **$5,500**; channel 5 ft. deep from mouth of St. Marys River to anchorage basin of same depth within creek, Channel to Island Creek, Saint George Island, **$10,000**; channels 6 ft. deep at upper and lower entrances to sound, St. Catherines Sound, **$11,500** ($600 local contribution); channel 6 ft. deep to and incl. anchorage basin of same depth in Black Walnut Harbor, **$21,000**; channel 10 ft. deep opposite Shipyard Cove, then 8 ft. and 7 ft. deep to and incl. turning basin at head of improvement, with anchorage basins 300 ft. square, 10 ft. and 8 ft. deep in Shipyard Cove and Crocketts Cove, Town Creek, **$25,000**; channel 6 ft. deep to and incl. mooring basin of same depth at head, Duck Point Cove, **$19,500**; channel 7 ft. deep to and incl. mooring basin of same depth at head of cove at Wenona, Lower thoroughfare, Deals Island, **$22,000**; relocating anchorage basin and connecting channel, Crisfield Harbor (no cost); exten. navigable channel in Pocomoke River above bridge at Snow Hill, 9 ft. deep, 100 to 150 ft. wide with turning basin at upper end of channel, Pocomoke River, **$8,500** ($4,250 local contribution). CD 2/18—ENR 3/9.

†**Massachusetts**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., channel 8 ft. deep, 100 ft. wide along general alinement of existing channel from its junction with easterly channel in vicinity of buoy C-11 to water front at Duxbury and for an anchorage basin of 21 acres, Duxbury Harbor, **$106,000** ($35,000 local contribution).

★ †**Michigan**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., to provide that existing turning basin near mouth of Paw Paw River be no longer maintained and that a turning basin 18 ft. deep be dredged on north side of St. Joseph River just above mouth of Morrison Channel, St. Joseph Harbor, **$74,000**; channel 300 ft. wide, 21 ft. deep from enlargement in the existing channel at Grand Trunk

STWAR PROJECTS (Cont'd.)

stern car-ferry slip to and incl. turning in 18 ft. deep at Grand Trunk Western ilroad Bridge, Grand Haven Harbor and and River, **$150,000;** removal of south etment, construct about 900 ft. new pier revetment 300 ft. south of and parallel existing north pier and revetment, widen- river entrance channel to 250 ft. with th of 21 ft., exten. about 1,000 ft. up- eam from outer harbor basin, Manistee rbor, **$147,000;** navigation channel 25 ft. ep and generally 700 ft. wide through st critical length of Southeast Bend, St. ir River, **$135,000;** channel 21 ft. deep, ft. wide at low water datum, passing rth of Belle Isle and exten. from deep ter near Windmill Point to point opposite irview Slip, Detroit, **$85,300.** CD 2/18—NR 3/9.

†**Michigan, Minnesota** and **New York**—U. S. Eng., 21 St. and Virginia Ave., W., Wash., 25, D. C., provision of con- uous chain of harbors of refuge for light- aft vessels along entire United States ast line of Great Lakes, so located that aximum distance between harbors will be om 30 to 40 mi., improvements proposed following localities: Chippewa Harbor, le Royal, Black River, Eagle Harbor, Lac Belle, Grand Traverse Bay, Big Bay, ttle Lake and Whitefish Point, Mich., Lut- n and Beaver Bay, Minn., all foregoing Lake Superior; St. James Harbor, Beaver land, Mich., on Lake Michigan; Hammond y, Harrisville, Oscoda, Port Austin, Port nilac and Point Loockout, Mich., all fore- ping on Lake Huron; Barcelona and Grand iew Bay, N. Y., on Lake Erie; Oak Orchard nd Port Ontario, N. Y., on Lake Ontario, **3,446,255** (incl. $1,415,620 local contribu- ion).

†**Michigan and Wisconsin**—U. S. Eng., 21 and Virginia Ave. N.W., Wash., 25, C., exten. channel 12 ft. deep, 90 ft. wide ver distance of 2,500 ft. to vicinity Mari- ette Yacht Club, Menominee Harbor and River. CD 2/18—ENR 3/9.

†**Minnesota**—U. S. Eng., 21 St. and Vir- inia Ave. N.W., Wash., 25, D. C., imprv. xisting navigable channel at St. Paul pro- iding for small boat harbor at lower end Harriet Island, enlarging flood capacity of ain channel, and for placing dredged ma- erial so as to form base for roadway along ft bank of river, Mississippi River, between issouri River and Minneapolis, **$130,000** ncl. $41,200 local contribution); providing work for imprv. drainage at Cochrane to rectify conditions caused by Federal naviga- tion imprv. on upper Mississippi River be- tween Missouri River and Minneapolis, **$33,-00.** CD 12/1—ENR 12/16; channel 6 ft. deep, 75 ft. wide over length of 2,000 ft. from mouth to and incl. turning basin of ame depth opposite village wharf, Bau- dette Harbor, **$15,000;** dredged harbor con- sisting of flared entrance 12 ft. deep between sheltering rock points, thence a section 10 ft. deep, 60 ft. wide, 100 ft. long, and then 2 inner slips ea. 60 ft. wide, 8 ft. deep with an aggregate length of 850 ft., Knife River Harbor **$14,000.** CD 2/18—ENR 3/9.

†**Mississippi**—U. S. Eng., 21 St. and Vir- ginia Ave. N.W., Wash., 25, D.C., entrance channel 6 ft. deep, 50 ft. wide to Old Fort Bayou, Biloxi Harbor, **$4,000;** entrance channel 8 ft. deep, 100 ft. wide from Back Bay through Cranes Neck into Bayou Ber- nard, Biloxi Harbor, **$6,000;** project Pass Christian Harbor, to provide imprv., main- tenance of harbor and entrance channel to 7 ft. depth, **$17,000;** channel 6 ft. deep, 40 ft. wide to turning basin which will be 6 ft. deep, 100 ft. by 150 ft. in area in vicinity of boat yard about 1 mi. above mouth, Bayou Galere, **$8,000.** CD 2/18—ENR 3/9.

★†**Montana**—Bureau Reclamation. Interior Bldg., 19 and C Sts. N.W., Wash. 25. D. C., Hungry Horse Dam on south fork of Flathead River, incl. dam, reservoir, power plant and "Kalispell" irrigation proj., Flathead Co. **$40,000,000.**

★†**New Jersey**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., imprv., maintaining inshore channel and providing depth of 37 ft. in rock and 35 ft. in other material and general width of 400 ft. in main bay channel from Kill Van Kull to branch channel leading toward Port Newark Terminal, thence for a branch channel of equal depth, 600 ft. wide, 0.4 mi. long and an inshore channel of equal depth, 400 ft. wide, 1.2 mi. long to the Port Newark Terminal, for removal of an area at Bergen Point to equal depth and for widening bend above Central Railroad of New Jersey Bridge, Newark Bay, Hackensack and Passaic Rivers, **$3,390,000;** channel 8 ft. deep, 100 ft. wide and about 0.9 mi. long from 8 ft. contour in Raritan Bay to mouth of Way Cake Creek, **$30,000;** channel 8 ft. deep, 75 ft. wide to point 1,000 ft. upstream from Main Street Bridge with widening at bends, Compton Creek, **$16,000;** channel 18 ft. deep across entrance bar then 12 ft. deep in Main and South Channels and 8 ft. deep to municipal boat basin, with anchorage basin 12 ft. deep and 7.3 acres in extent adjacent to 12 ft. channel, Shark River, **$118,000;** channel 12 ft. deep from ocean at Manasquan Inlet to Delaware Bay above Cape May, New Jersey Intracoastal Waterway, partly constructed **$1,500,000** to complete; deepening existing Federal Channel incl. slight 12 ft. exten., except in reach seaward of inner end of north jetty where depth is to be 14 ft., dredging depth of 10 ft. an anchorage of 19 acres, south of exist-

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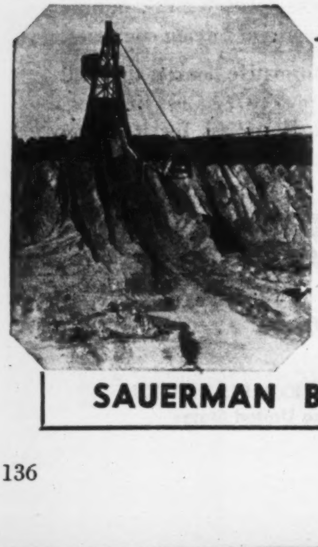

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POSTWAR PROJECTS (Cont'd.

ing project, and dredging to depth of ft. an anchorage of 27.5 acres, about 0.5 m west of Route 35 Highway bridge, Mana quan River, **$143,000;** entrance channel ft. deep, 400 ft. wide, protected by parall jetties and exten. from 25 ft. depth in A lantic Ocean to line 500 ft. harborward line joining inner ends of jetties, thence ft. deep, 300 ft. wide to deep water in Co Spring Harbor Cold Spring Inlet, **$71,0** CD 2/18—ENR 3/9.

★ **†New York**—U. S. Eng., 21 St. and Vi ginia Ave., N.W., Wash., 25, D. C., north entrance be deepened to 25 ft. in ear and 26 ft. in rock (b) Buffalo River e trance channel be deepened to 22 ft. earth and 23 ft. in rock, southern proje limit to be 5 ft. from south pier with dredg ing limits 25 ft. therefrom until such tim as the south pier is rebuilt, and norther project limited to be shifted from its presen location to 40 ft. from and parallel to dock of the Delaware, Lackawanna & Wester Railroad (c) Buffalo River and Buffalo Shi Canal be deepened and maintained to 22 f in earth and 23 ft. in rock to the Delaware Lackawanna & Western Railroad bridge jus upstream of Standard Oil Co. terminal an to the Lehigh Valley Railroad Canal, re spectively, with widths generally of 150 f and 125 ft. respectively, dredging to be no closer than 25 ft. from dock lines expec at bends and rock ledge just above th Ohio St. bridge to be cut back approx. 1 ft. (d) westerly project limit in outer har bor be 150 ft. from and parallel to axes o breakwaters (e) shallow undredged strip along breakwater and the triangular area i northwestern and northeastern portions, respectively of southern outer harbor area be dredged and maintained to depth of 23 ft. until such time as local interests meet prescribed local cooperation permitting dredging to project depth of 25 ft., Buffalo Harbor, **$3,171,000;** modification existing project for Black Rock Channel and Tonawanda Harbor so as to include therein the triangular-shaped area at southerly entrance channel now included in projects for Buffalo Harbor, and for widening southerly entrance channel by deepening of second and adjoining triangular area to 22 ft., in rock and 21 ft. in earth, Black Rock Channel and Tonawanda Harbor, **$108,000;** restoration piers and for entrance channel 80 ft. wide, 8 ft. deep, Wilson Harbor, **$131,000;** providing for depths of 12 ft. within an L-shaped area; the inner or westerly leg of the L to be 250 ft. and 600 ft. long, easterly leg to extend from westerly leg to natural deep water in Black River Bay and to have width of 250 ft. at junction of legs, flaring at an angle of 40 degrees to form entrance to harbor, Sackets Harbor, **$121,000;** providing for depth of 16 ft. in area behind and adjacent to breakwater for depth of 20 ft. in an area downstream from breakwater and for elimination from project of uncompleted portion of authorized breakwater, Cape Vincent Harbor, **$59,000;** imprv. Great Lakes to Hudson River Waterway providing depth of 13 ft. below normal pool level through all locks in canal between Waterford and Oswego, the Waterway consists of Erie and Oswego Canals and extends across state from Waterford on Hudson River to Tonawanda on Niagara River and to Oswego on Lake Erie **$1,010,000,** the work to be performed by State of New York with Federal funds under Federal control; interior channel exten. from vicinity of Marine Parkway Bridge along west and north shores of bay, 18 ft. deep and 300 ft. wide to Mill Basin, with swinging basin 1,000 ft. wide, 1,000 ft. long at that point, thence 12 ft. deep and 200 ft. wide to Fresh Creek Basin, interior channel exten. from same locality along south shore to Head of Bay, 15 ft. deep, 200 ft. wide, entrance channel connecting the 2 interior channels with deep water in Atlantic Ocean, of suitable hydraulic dimensions maintaining present tidal prism in bay, but not less than 18 ft. deep, 500 ft. wide from opposite Barren Island to Rockaway Point, thence enlarging to not less than 20 ft. deep, 1,000 ft. wide, protected by one existing riprap jetty, south shore of Long Island, Jamaica Bay, **$270,000;** entrance jetty and channel 12 ft. deep, 250 ft. wide from that depth in ocean, through inlet to Loop Causeway Bridge over Long Creek, in Hempstead Bay on south shore of Long Island, Jones Inlet **$1,800,000** ($900,000 local contribution; channel 8 ft. deep, 100 ft. wide and small boat anchorage 6 ft. deep and 15 acres in area adjacent to channel, **$30,000** ($15,000 local contribution); north shore of Long Island, Northport Harbor, exten. existing channel 6 ft deep, 100 ft. wide to deep water in Great Peconic Bay by removing shoals at entrance, providing access to Peconic River, eastern end of Long Island, Peconic River **$20,000;** channel 12 ft. deep at mean low water and 150 ft. wide extend. from 12 ft. contour in Block Island Sound to same depth in existing yacht basin east of Star Island, boat basin 10 ft. deep, 400 ft. wide, 900 ft. long, northwest of Star Island, repairing, exten. shoreward east and west jetties, Lake Montauk Harbor, partly constructed **$65,000** to complete; channel 8 ft. deep, 75 ft. wide from Great South Bay to branches of creek and through west branch 8 ft. deep for full width to head of navigation at Montauk Highway, south shore of Long Island, Orowoc Creek, **$30,400** ($15,200 local contribution). CD 2/18—ENR 2/24.

POSTWAR PROJECTS (Cont'd.)

N. Y., Bear Mountain—Dpt. P. Wks., State Office Bldg., Albany, plans underway Proj. No. CON-54, rebuilding bulkhead in River at Bear Mountain State Park, for Palisades State Park Com., Conservation Dpt. **$75,000.** Knapper Engrg. Co., 132 E. 33 St., New York., consult. engrs.

★**†North Carolina**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., modification existing project for inland waterway, Beaufort to Cape Fear River, incl. waterway to Jacksonville, providing channel 8 ft. deep, 90 ft. wide, exten. from waterway via Motte and Banks Channels to point just with Masonboro Inlet at Wrightsville Beach, **$9,000**; increasing width of authorized 30 ft. channel to Wilmington from 300 to 400 ft. with increased width at bends, increasing width of authorized turning basin from 600 to 800 ft. with suitably lengthened approaches, providing channel 12 ft. deep, 100 ft. wide from inland waterway entrance 3 mi. to main channel, Cape Fear River at and below Wilmington, **$75,000**; depth of 32 ft. in river channel from ocean to Wilmington and in turning basin, incl. lengthening approach to anchorage basin, **$790,000.**

★**†North Carolina and South Carolina**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., imprv. Santee, Congaree and Broad Rivers from navigation and power development by construction of Blairs, Frost Shoals, Greater Lockhart, Clinchfield, Buckingham Landing and Columbia hydroelectric power developments, and channel 8 ft. deep, 150 ft. wide in Santee and Congaree Rivers between Columbia and Santee Reservoir, **$163,250,000.**

†Ohio—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., inclusion of bay channel in authorized Federal project and for its maintenance by United States to provide depth of 22 ft. and widths varying from 300 to 400 ft., and for removal certain parts of turning basin and rock dike from authorized Federal project, Sandusky Harbor; turning basin 20 ft. deep in bend of Black River immediately upstream from Baltimore & Ohio Railroad Co.'s dock, Lorain Harbor, **$30,000;** turning basin 21 ft. deep, maximum width 700 ft., exten. 780 ft. upstream from existing project limit in Cuyahoga River, Cleveland Harbor, **$191,000;** further imprv. Cleveland Harbor by exten. authorized channel in Cuyahoga River for about 1,400 ft. above present limit so as to give access to new plant of Republic Steel Corp., Cleveland Harbor, **$106,000;** channel 16 ft. deep with bottom width of 100 ft. to point 1,500 ft. upstream from southerly boundary of turning basin, Ashtabula Harbor, **$38,000.** CD 2/18—ENR 3/9.

†Pennsylvania—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., approach channel 300 ft. wide, 23 ft. deep from existing 25 ft. basin in harbor to and incl. turning basin of same depth 1,200 ft. long, 1,000 ft. wide and that the following areas be omitted from authorized imprvs., (1) channel 300 ft. wide, 21 ft. deep connecting northerly end of existing 21 ft. deep harbor area with natural deep water in bay, (2) channel of approach to westerly coal dock 200 ft. wide, 21 ft. deep exten. from deep water in bay to line 50 ft. outside harbor line, (3) an area 20 ft. deep of about 5½ acres, exten. from deep water in the bay to harbor line and leading to westerly sand dock, Erie Harbor, **$467,000.**

★**†Oregon**—U. S. Eng., Pittock Block, Portland, plans 25% completed 5,400 ft. levees to imprv. channel in Milton-Freewater Sect. Walla Walla River, Umatilla Co. **$567,000.** Col. F. A. Tudor, Pittock Block, Portland, engr.

★**†Ore., Detroit** — U. S. Eng., Pittock Block, Portland, plans completed 1,580 ft. concrete dam on North Santiam River, **$27,650,000.** Col. F. A. Tudor, Pittock Block, Portland, engr. CD 1/12—ENR 1/27, under Oregon.

★**†Ore., Sweet Home**—U. S. Eng., Pittock Block, Portland, plans completed 3,660 ft. earth dam at Sweet Home on South Santiam River, **$7,165,000.** Col. F. A. Tudor, Pittock Block, Portland, engr.

★**†Pennsylvania** and **New Jersey**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., depth of 37 ft. in channel from Allegheny Ave. to Philadelphia-Camden Bridge and in Port Richmond anchorage, Delaware River, Phila., Pa. to the sea. **$1,036,000.**

★**†Pennsylvania and New York**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., waterway 12x250 ft. for both Beaver and Mahoning Rivers; single locks 56x720 ft.; necessary railroad bridges, **$38,500,000.**

†Rhode Island—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., channel, 10 ft. deep, 100 ft. wide from 10 ft. depth in outer harbor to wharves near highway bridge at Wickford, anchorage area of 6 acres and 6 ft. deep in Wickford Cove, entrance channel 10 ft. deep, 100 ft. wide from outer harbor into deep water in Mill Cove, Wickford Harbor, **$44,000;** dredging entrance channel, 100 ft. wide, 12 ft. deep from Great Salt Pond into Inner Harbor and dredging basin of about 1.4 acres in harbor to same depth, Great Salt Pond (Inner Harbor, Block Island), **$16,000** ($8,000 local contribution).

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POSTWAR PROJECTS (Cont'd.)

†South Carolina—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., providing anchorage basin 125 ft. wide, 325 ft. long, 12 ft. deep outside of channel limits of Intracoastal Waterway, near Myrtle Beach, Cape Fear River to St. Johns River Intracoastal Waterway Anchorage Basin **$11,000**; widening entrance channel and channel 30 ft. deep, 200 ft. wide exten. from head of present 30 ft. channel to vicinity of plant of Pittsburgh Metallurgical Co. with turning basin 30 ft. deep at its upper end, Shipyard River, **$246,500**.

★ **†Tennessee**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., waterway connecting Tennessee and Tombigbee Rivers by way of East Fork of Tombigbee River, Mockeys Creek and Yellow Creek providing channel of not less than 9 ft. in depth and minimum bottom width of 170 ft. in river and canal sections and 115 ft. in divide cut, with locks approx. 45x450 ft. inside dimensions, **$66,000,000**.

★ **†Texas**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., providing exten. Beaumont turning basin upstream 300 ft., thus forming turning basin 350x2,300 ft., Sabine-Neches Waterway, **$10,000**; widening Port Arthur west turning basin to 600 ft. for distance of 900 ft. from east end, suitably flared at entrance, thence tapering distance of 800 to 325 ft. at west end at depth of 34 ft., Sabine-Neches Waterway, **$18,000**; constructing Rockland Reservoir on Neches River-McGee Reservoir on Angelina River and 2 power-reregulating dams A and B on Neches River below Rockland Dam, Neches and Angelina Rivers, **$28,000,000**; approval of comprehensive plan of improvement outlined in district engineers report and construction Benrook, Little Elm and Grapevine Reservoirs, modification Garza Dam, imprv. levees and floodways at Fort Worth and Dallas for flood protection and water conservation in Trinity River Basin and modification existing 6 ft. navigable channel from the Houston Ship Channel to Liberty, to provide 9 ft. depth, 200 ft. wide in Galveston Bay and 150 ft. wide in river section and with turning basin at Liberty, Trinity River, **$15,000,000**; modify the recommended plan for initial step improvement Trinity River, providing for constr. of Lavon Reservoir on east fork of Trinity River, **$3,733,000**; branch channel 10 ft. deep in old channel of Buffalo Bayou behind Brady Island, Houston Ship Channel, **$21,300**; providing for depth of 34 ft. in all project channels and basins from Port Aransas to and incl. Tule Lake turning basin, channel 250 ft. wide between Port Aransas and breakwater at Corpus Christi, for width of 200 ft. in industrial canal and in channel between Avery Point and Tule Lake turning basins and for widening Avery Point turning basin to 1,000 ft., Aransas Pass-Corpus Christi, **$830,000**; channel 6 ft. deep, 100 ft. wide from Port Lavaca by way of Lavaca Bay and River to Mile 3 on Navidad River, total distance 20 mi., Lavaca and Navidad Rivers, **$85,000**; channel clearing, straightening and enlargement for flood control upstream on Lavaca and Navidad Rivers and tributaries, as well as relocation Southern Pacific Railroad bridge at Hallettsville and imprv. Lacava River in that vicinity, Lavaca and Navidad Rivers, **$348,000**; modification existing project for Guadalupe River to provide a channel 9 ft. deep, 100 ft. wide, exten. from Louisiana-Texas Intracoastal Waterway by way of Seadrift to point on Guadalupe River 3 mi. above Victoria, constructing Canyon Reservoir for stream-flow regulation in interests of navigation and power development and for flood control, constructing power plant at Canyon Dam provided further field investigations show such a development to be practicable, Guadalupe River, **$8,500,000**; enlargement turning basin at Port Isabel to 1,300 ft. in length by 1,000 ft. in width, Brazos Island Harbor, **$127,500**; further modification existing project for Brazos Island Harbor, to provide for deepening channel through Brazos-Santiago Pass to 35 ft. from deep water in Gulf of Mexico; deepening, widening bay channel to 33x200 ft., deepening Brownsville Channel to 32 ft., deepening Port Isabel Channel and turning basin to 32 ft., exten. north side Brownsville turning basin 5,140 ft. to east and deepening basin to 32 ft., dredging shallow-draft channel from railroad bridge around south part of Port Isabel to shore line to Laguna Madre and shallow-draft channel connecting with Port Isabel turning basin to provide depth of 6 ft. and width of 60 ft., Brazos Island Harbor, **$635,000**, CD 2/18—ENR 3/9; providing short branch channel 6 ft. deep, 60 ft. wide from point on Intracoastal Waterway near Port O'Connor into Barroom Bay, Louisiana and Texas Intracoastal Waterway to Barroom Bay, Tex. **$6,300**, CD 2/18—ENR 3/9, under Louisiana and Texas.

★ **†Virginia**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., inland waterway 6 ft. deep from Chincoteague Bay via Chincoteague Channel and various waters and land cuts to Fishermen Inlet and Chesapeake Bay at Cape Charles distance of 84 mi., **$263,000**; channel 9 ft. deep, 100 ft. wide from depth in Chesapeake Bay to vicinity of Davis and Morley wharves with approach channels of equal dimensions to wharves and a turning basin 9 ft. deep, 200 ft. wide, 300 ft. long adjacent to Concord wharf, Occohannock Creek, **$37,000**; channel 6 ft. deep, 60 ft. wide from deep water in Liscombes Channel to and incl. turning basin of same depth 200 ft. long, 125 ft.

POSTWAR PROJECTS (Cont'd.)

wide along water front at Oyster, Oyster Channel, **$29,000**; channel 8 ft. deep at mean low water and 100 ft. wide from the 8 ft. contour in Tangier Sound to day marker No. 4, and thence 60 ft. wide to town of Tangier, Tangier Channel, **$10,100**; entrance channel 0 ft. wide, 6 ft. deep across offshore bar from that depth in Great Wicomico River to deep water in Cranes Creek, distance of about 1,500 ft., Cranes Creek, **$7,500**; channel 10 ft. deep from that depth in Rappahannock River to and incl. turning basin below Totuskey Bridge with width of 60 ft. through bar at entrance and 100 ft. thence upstream, suitably widened at bends, Totuskey Creek, **$45,000**; channel 10 ft. deep from that depth in Rappahannock River to highway bridge ¾ mi. about mouth with width of 100 ft. in river and 80 ft. inside creek, suitably widened at bends and turning basin of same depth, 250 ft. long, 00 ft. wide, Hoskins Creek, **$16,000**; exten. westerly limit of turning basin at Urbanna to pierhead line, Urbanna Creek, **$9,600**; channel 4 ft. deep, 70 ft. wide across offshore bar at entrance, from deep water in Rappahannock River to Snake Point in entrance to creek, distance of approx. 3,100 ft., Whitings Creek, **$12,000** ($500 local contribution); entrance channel 7 ft. deep, 100 ft. wide from deep water in Rappahannock River to deep water in entrance to Broad Creek, $20,500; channel 5 ft. deep, 50 ft. wide between Bassett Ferry and Manquin, Bridge, Pamunkey River, **$10.000**; deepening existing channel from mouth to lower end of turning basin to 12 ft., enlarging, deepening turning basin to act also as settling basin, dredging settling basin at mouth of Poes Run, exten. channel of such depth, not exceeding 12 ft., as can be obtained without rock excav., from upper end of turning basin to head of existing project at Petersburg, Appomattox River, **$110,000**; channel in Herberts Creek, 100 ft. and 80 ft. wide, 12 ft. deep exten. from existing improved channel in Hampton Creek upstream to Jackson St., Hampton Creek, **$15,000**; channel 500 ft. wide, 18 ft. deep along existing channel alinement from deep water in Chesapeake Bay to harbor basin, enlarging basin 600 and 1,000 ft. wide, 3,000 ft. long, 18 ft. deep and 1,350 ft. sand mole south of harbor entrance, Cape Charles City (Harbors), partly constructed, **$158,000** to complete; 25 ft. channel 300 ft. wide between Norfolk & Western R. R. bridge and Campostella Bridge, maintaining existing turning basin at head of project to 25 ft. depth over 5½ acres, Norfolk Harbor, **$35,000**; dredging, maintaining turning basin 200 ft. wide, 600 ft. long, 18 ft. deep at mean low water, to occupy same area dredged by city of Richmond as turning basin, James River, **$27,000**. CD 2/18—ENR 3/9.

†**Virginia and North Carolina**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., protecting canal property against storm tides by constructing dikes, appurtenant works, Inland Waterway from Norfolk, Va. to Beaufort Inlet, N. C., **$39,000**.

★†**Washington**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., deepening to 30 ft. of easterly 150 ft. more or less of shoal between deep water in Port Angeles Harbor and pierhead line in vicinity of plant of Rayonier, Inc., Port Angeles Harbor, **$10,000**; entrance channel 500 ft. wide to and incl. turning basin 3,350 ft. long and generally 960 ft. wide, suitably flared at entrance, all at depth of 30 ft. at mean low water, Olympia Harbor **$88,000**; imprv. Wapato Waterway to provide depth of 30 ft., Tacoma Harbor, **$200,000** (incl. $40,000 local contribution); imprv. entrance to Stillaguamish River providing channel 75 ft. wide with bottom at elevation of mean lower low water from Stanwood through South Pass to Port Susan, Stillaguamish River, **$35,000**; imprv. Lake Crockett to provide basin therein with area of about 6 acres and depth of 18 ft. connected with Admiralty Bay by channel of same depth and 150 ft. wide, protected by breakwater, Lake Crockett, **$225,000**. CD 2/18—ENR 3/9.

†**Wisconsin**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., widening authorized 400 ft. channel, along water front in westerly part of harbor, so as to afford a channel 400 ft. wide at its easterly and gradually flared to width of 750 ft. at its westerly end, Ashland Harbor, **$24,000**; turning basin 22 ft. at mouth of East River area of Green Bay Harbor, **$86,000** (incl. $30,000 local contribution); turning basin 20 ft. deep on southwesterly side of existing channel, southeasterly of existing highway bridge, Sturgeon Bay and Lake Michigan Ship Canal, **$11,000**; providing depth of 21 ft. in inner harbor channels, Milwaukee Harbor, **$110,000**; channel dredging in Root River shall terminate at point about 195 ft. below north line of Bridge Street extended, Racine Harbor, **$2,100**; deepening outer basin from about 400 ft. west of entrance to about 750 ft. west of outer end of north stub pier and dredging along south side of basin in outer harbor increasing its width from 825 to 1,000 ft., depths to be 21 ft., Racine Harbor, **$47,000**. CD 2/18—ENR 3/9.

†**Alaska**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., modification existing project by eliminating therefrom provision for construction of breakwaters between Japonski Harbor and Aleutski Islands and adoption of project providing for imprv. of Crescent Bay at Sitka by

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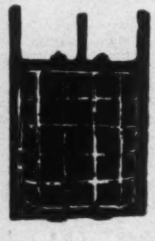

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POSTWAR PROJECTS (Cont'd.)

dredging area about 13 acres to depth o 10 ft. below mean lower low water an constructing protective breakwaters, Sitk Harbor, **$385,000;** dredging at face of whar to depth of 30 ft. at mean lower low wate for southerly 700 ft. and to depth of 2 ft. for next 100 ft. and for dredging basi for small boats to depth of 8 ft. over a area of 1 acre near north end of whar Skagway Harbor, **$16,000.**

†Territory of Hawaii—U. S. Eng., 21 St and Virginia Ave. N.W., Wash., 25, D. C elimination of runway C and its protectiv breakwater and for construction with pro tective breakwaters of runway D about 2.2 mi. long, 1,000 ft. wide, 10 ft. deep, exten in general northwest-southeast direction and intersecting runways A and B near thei easterly ends with addnl. breakwaters a westerly ends of runways A and B, Keeh Lagoon, Oahu; dredging area northerly side of existing project 200 ft. wide, 1,200 ft long and 35 ft. deep, Port Allen Harbor, **$75,000.** CD 2/18—ENR 3/9.

†Puerto Rico—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash., 25, D. C., modification of existing project for Ponce Harbo by elimination of improvement of area for 9 ft. depth and to provide for dredging to depth of 30 ft. at mean low water for an area channelward of line 100 ft. from faces of municipal pier and for construction breakwater 2,400 ft. long, **$400,000;** approach channel 28 ft. long, 200 ft. wide together with turning basin of same depth and 10. acres in extent, Fajardo Harbor, **$241,00** (incl. local contribution). CD 2/18—ENR 3/9.

PUBLIC BUILDINGS

★**Ind., Evansville**—City, M. L. Reichert, mayor, J. Erwin Taylor, clk., City Hall, hospital. **$1,000,000.**

★**Ind., Indianapolis**—City, plans by McQuire & Shook, Architects Bldg., 200 bed unit for paying patients, 150 bed psychopathic ward, 150 bed isolation or contagious unit, nurses' home addn., present nurses' home alterations, enlarging power plant, laundry and garage. **$2,500,000.**

★**La., Bogalusa**—City Pub. School Bldg., Bogalusa, voted **$200,000** bonds high school bldg.; **$150,000** bonds intermediate pub. school bldg.; **$150,000** bonds grade school bldg.; **$150,000** bonds elementary school.

★**Mass., Norfolk**—Commonwealth of Massachusetts, Dpt. Mental Health, 100 Nashua St., Boston, plans 20% complete, brick, steel, concrete central bakery unit, PG 1. **$500,000.** Ganteaume & McMullen, 99 Chauncy St., Boston, consult. engrs.

★**Mich., Detroit**—City Dpt. P. Wks., City Hall, preliminary studies started by Suren Pilafian, 112 Madison Ave., incl. structures and landscaping, circulation and parking diagrams, cost estimates, structures to be included, location and size of bldgs., integration with existing and proposed transportation facilities on site bounded by Jefferson Ave., Wayne and Randolph Sts., and Detroit River. **$23,000,000.** G. R. Thompson, City Hall, city engr. CD 3/30/43—ENR 4/1/43.

★**N. Y., Albany**—Dpt. P. Wks., State Office Bldg., Albany, gymnasium **$438,90**, commercial studies bldg. **$157,500,** library addn. **$231,840** ,at State College for Teachers, for Dpt. Education, Education Bldg., Albany. CD 7/30—ENR 8/5.

★**N. Y., Cortland**—Dpt. P. Wks., State Office Bldg., Albany, physical education and health bldg. **$501,840,** heating plant **$170,000,** at State Teachers College, for Dpt. Education, State Office Bldg., Albany.

★**N. Y., Floral Park**—Central School Dist. 2, Floral Park, Sewanhaka High School addn., **$1,025,000;** development of site, **$53,000;** heating plant, Sewanhaka High School, **$107,000.** State Aid Planning Funds allotted.

★**N. Y., New York**—Dpt. Parks, Arsenal Bldg., Central Park and 64 St., Zone 21, addn. Central Bldg., N. Y. Public Library, **$2,936,665.**

N. Y., New York — New York Zoological Society, 630 5 Ave., plans underway by Harrison Fouilhoux & Abramovitz, 45 Rockefeller Plaza, and A. Embury II, 150 E. 61 St., biological and pathological research center at Bronx Zoological Gardens. **$200,000.** CD 1/25/43—ENR 1/28/43.

★**N. Y., New York**—Port of New York Auth., 111 8 Ave., plans underway Union Midtown Bus Terminal near Manhattan portal of Lincoln Tunnel. **$6,000,000.** State Aid Planning Funds allotted. J. C. Evans, ch. engr., R. Smiley, engr. of design, 111 8 Ave.

★**N. Y., Ogdensburg**—Dpt. P. Wks., State Office Bldg., Albany, plans completed Proj. No. MH-59 power house, incl. service connections, spur track exten., imprv. grounds and reconstructing tunnels and heating lines at St. Lawrence State Hospital, for Dpt. Mental Hygiene, State Office Bldg., Albany, **$969,700.** Div. Construction, Div. Architecture, C. J. White, comr. Architecture, State Office Bldg., Albany, engr.

★**N. Y., Watertown**—City, Senior High School bldg. **$910,000.** State Aid Planning Funds allotted.

OSTWAR PROJECTS (Cont'd.)

★ **N. Y., West New Brighton (sta. Staten Island)**—Dpt. P. Wks., Municipal Bldg., ew York, preliminary studies, drawings, nd outline specifications completed by ggers & Higgins, 542 5 Ave., New York, ew construction, expan. and reconstruction Sea View Hospital, for Dpt. Hospitals, 25 Worth St., New York. **$7,275,000.**

★ **O., Cleveland**—City, C. Celebrezze, dir. Pub. Safety, City Hall, fire dpt. headquarters bldg., **$2,182,500**; Fire Station 41, t E. 116 St. and Melba Ave., **$171,500**; plans nderway Fire Station 42, Pearl Rd. and Stickney Ave., **$169,000**; general rehabilitation fire stations, **$137,000**, constructing new rill tower, **$45,700**; new fire station, at Puritas and Rockey River Dr., **$150,000**; plans complete fire station, E. 131 St. and t. Clair Ave., **$133,000**, at Gehring and Freeman Aves., **$125,000.** H. Kregelius, 517 City Hall, city archt. CD 12/10—ENR 12/16.

★ **Ore., Salem**—State Bd. Control, 109 State Capitol, plans 2 ward bldgs., **$520,-00**; commissary and recreation bldg., **$185,-00**; plans completed treatment hospital, **45,000**, all foregoing at State Hospital; plans patients' dormitory, **$150,000**, employees' dormitory, **$150,000** and auditorium, **150,000**, foregoing at Oregon Fairview Home (feeble minded); primary school bldg., **$155,-00** and girls' dormitory, **$150,000**; advanced chool bldg., **$170,000**, foregoing at State School for Deaf; school bldg. at State School for Blind, **$160,000**; building for criminally insane at State Penitentiary, **$170,000**; ward building at State Hospital Farm, **$216,000.**

★ **Tex., Austin**—Bd. Educ., Municipal Bldg., 124 W. 8 St., 2 school addns., alterations, over **$150,000**; outside heating plant units, **150,000**; to vote **$200,000** bond issue, school for crippled and defective children; to vote **$350,-00** bond issue Junior High School.

★ **Tex., Houston**—City, police station, jail, etc. **$2,300,000.** G. L. Fugate, City Hall, engr. CD 5/7/43—ENR 5/13/43.

COMMERCIAL BUILDINGS

★ **Ind., Hanover**—Hanover College, Bd. Trustees, P. E. Goodrich, pres., Winchester, plans underway by Jens Fredrick Larson, 27 E. Wheelock St., Hanover, N. H., college addns., incl. science bldg. **$150,000**, lass rooms and office bldg. **$200,000**, music and arts bldg. **$150,000**, preliminary plans physical education bldg. and central heating plant, **$200,000.**

★ **N. C., Winston Salem**—North Carolina Baptist Hospital, J. S. Lynch, mgr., plans by Northrup & O'Brien, Winston Salem, bldg. exten. Over **$2,000,000.** CD 5/4—ENR 5/18.

★ **O., Cleveland**—Syndicate, c/o E. H. Krueger, Hickox Bldg., wrecking present 5 story Hickox Bldg., replacing with a 6 story commercial bldg. (part of which is to be occupied by Bond Stores, Inc., J. W. Connors, in charge of construction, 251 Fifth Ave., New York, N. Y.). **$750,000.** CD 5/26.

INDUSTRIAL BUILDINGS

Ind., Indianapolis—TRUCK TERMINAL—Clemons Trucking Co., 800 Michigan Ave., South Bend, plans 20% completed, truck terminal, West and Henry Sts. **$60,000** or more with equip.

Mass., Boston — TERMINAL — Boston & Worcester Lines, Worcester Rd., Framingham, terminal, Park Square, **$50,000.**

UNCLASSIFIED

★ **Mich., Detroit**—STORAGE YARDS—Dpt. P. Wks., City Hall, imprvs., addns. to Northwest, St. Jean, 24 and Orleans Sts. storage yards, etc. **$975,000.** G. R. Thompson, City Hall, city engr.

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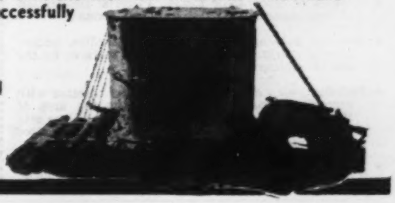

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POSTWAR PROJECTS (Cont'd.)

★**Mo., St. Louis**—AIRPORT—City, Mun pal Airport Comn., M. Kinse[illegible] chn., City Hall, 12 and Market Sts., Zone 3, p liminary plans being amended expan. La bert-St. Louis Municipal Airport at Brid ton, incl. covering Coldwater Creek from No. 6 runway east of Naval base and sou side of Runway 1, three 600 ft. runways a terminal bldg. on Natural Bridge road 2 nearer city than present terminal, coveri smaller water courses, grading, relocati of roadways, etc. **$5,000,000.** Horner Shifrin, Shell Bldg., 1221 Locust St., Zo 3, consult. engrs.

New York — BOAT LANDING PLA FORM, etc. — Dpt. P. Wks., State O Bldg., Albany, preliminary plans underw Proj. No. CON-12, boat landing platfo and boat basin enclosure at Fire Isla State Park, **$35,000;** plans underway by E. Haugaard, 350 Fifth Ave., New Yo Proj. No. CON-13, picnic bath house Heckscher State Park, **$40,000** and Pr No. CON-11A and CON-11B, developme Southland's Pond area—Belmont Lake Sta Park, **$100,000,** all Suffolk Co., for Lo Island State Park Comn., Conservation D

New York—DAM AND LAKE—Dpt Wks., State Office Bldg., Albany, plans u derway Proj. No. CON-9, dam and lake Stony Brook State Park, Steuben Co., f Finger Lakes State Park Comn., Conserv tion Dpt. **$38,000.** Barker & Wheeler, State St. Albany, consult. engrs.

New York—PARK BLDGS, etc.—Dpt. Wks., State Office Bldg., Albany, prelimina plans underway, Proj. No. CON-18, addn recreation areas and play facilities, **$30,0** plans underway by Wm. E. Haugaard, 2 5 Ave., New York, Proj. No. CON-17, a ministration office, accessory shop and fi aid bldg. **$60,000** and Proj. No. CON-16, We Overlook refreshment stand and comfo station, **$40,000,** all foregoing at Jones Beac State Park, Nassau Co., for Long Islan State Park Comn., Conservation Dpt.

New York—PARK BLDGS.—Dpt. P. Wk State Office Bldg., Albany, plans underw by Jones, Cox, Dreyer & Davis, 20 Vese St., New York, Proj. No. CON-3, 50 cabin complete facilities at Allegany State Par Cattaraugus Co.,, for Allegany State Par Comrs., Conservation Dpt. **$50,000.**

New York—PARK BLDGS.—Dpt. P. Wk State Office Bldg., Albany, plans underw by Jones, Cox, Dreyer & Davis, 20 Ve St., New York, Proj. No. CON-6, golf clu house annex **$35,000,** and Proj. No. CON- Fairway irrigation and drainage sys., **$27,0** at Green Lakes State Park, Onondaga Co for Central New York State Park Comn Conservation Dpt.

New York—PARK DEVELOPMENT—Dp P. Wks., State Office Bldg., Albany, plan underway Proj. No. CON-23, Queensbor Development at Harriman State Park, Rock land Co., for Palisades State Park Comn. Conservation Dpt. **$250,000.** Ammann Combs, 681 5 Ave., New York, archts.

N. Y., Bear Mountain—LAKE IMPROVE MENTS—Dpt. P. Wks., State Office Bldg Albany, plans underway Project No. CON 53, imprv. Grove and Hessian Lake, **$30,0** Ammann & Combs, 681 5th Ave., New Yor landscape archts.; Proj. No. CON-22, unde ground conduits **$30,000,** Knapper Engrg. Co 132 E. 72 St., New York, consult. engr both at Bear Mountain State Park, fo Palisades State Park Comn., Conservatio Dpt.

N. Y., Binghamton — TUNNELS, etc.— Dpt. P. Wks., State Office Bldg., Albany plans 90% completed. Proj. No. MH-53, replacement tunnels and heat connection **$220,000;** Proj. MH-61, renewing telephon sys. $25,000 at Binghamton Hospital, for Dpt Mental Hygiene, State Office Bldg., Albany Div. Constr., Div. Architecture, C. J. White comr. Architecture State Office Bldg., Albany engr.

★**N. Y., New York** — COAXIAL TELEPHONE CABLES — American Telephone & Telegraph Co., 195 Bway., Zone 7, 6,000-7,000 route miles coaxial telephone cable sections and projects incl. links between New York-Washington, completion in 1945; New York-Boston, Washington-Charlotte Chicago-Terre Haute-St. Louis-Los Angeles-Phoenix, completion in 1946; Chicago-Toledo-Cleveland-Buffalo, Southern Transcontinental Route, Charlotte-Columbia, Atlanta-Birmingham - Jackson - Dallas-El Paso-Tucson-Phoenix, completion in 1947; Southern Trans-continental (completion) Washington-Pittsburgh-Cleveland-St. Louis-Memphis-New Orleans-Kansas City-Omaha-Des Moines-Minneapolis - Atlanta - Jacksonville-Miami - Los Angeles-San Francisco, completion in 1948-1950. **$100,000,000.** Completion dates tentative

★**Ore., Ashland**—AIRPORT—City, City Hall, plans completed, airport, **$500,00** F. W. Walker, City Hall, engr.

★**Wis., Manitowoc**—PARKS, etc.—City, A Post, clk., City Hall, parks, **$557,17**; airport, **$429,481.** Provisions made for raising money. E. F. Walter, city engr.

★**Wis., Sheboygan** — AIRPORT — City, H Zehms, pres. Dpt. P. Wks., City Hall airport, **$1,000,000.** Provisions made for raising money. A. L. Boley, city engr.

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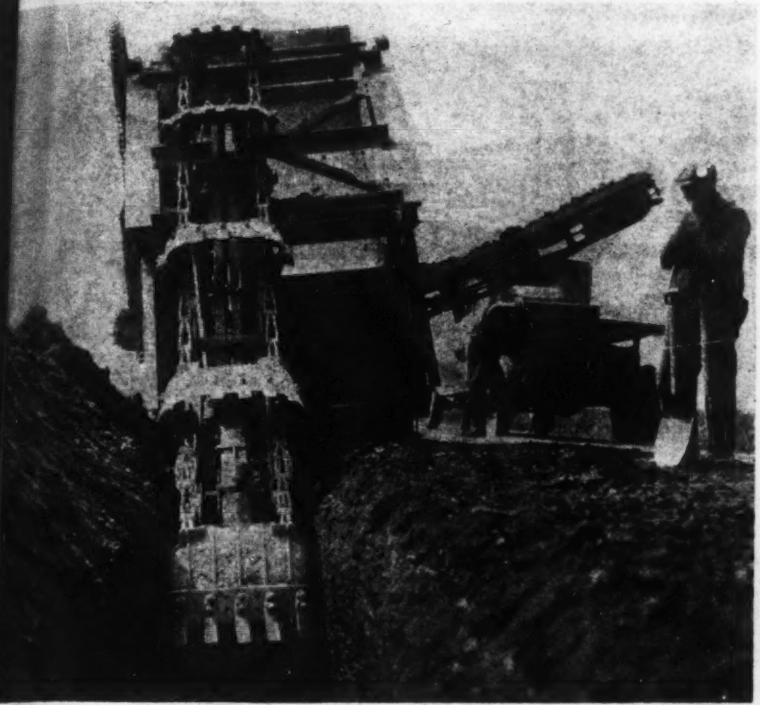

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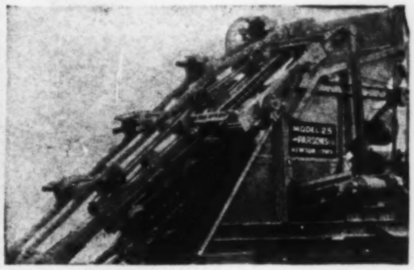

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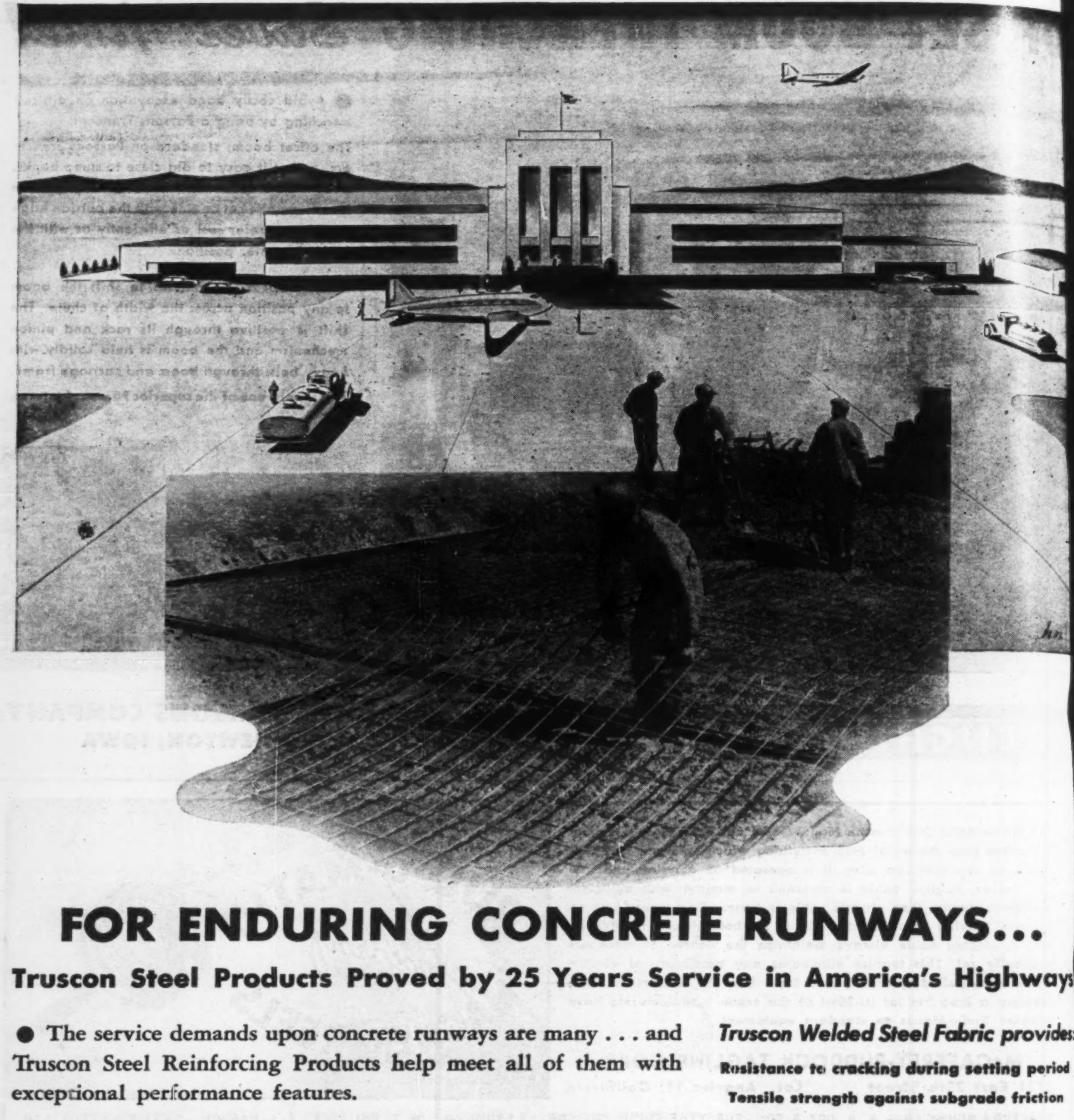

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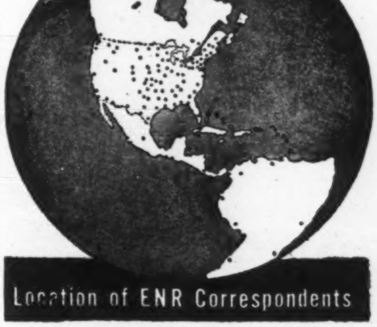

Location of ENR Correspondents

Symbols and Abbreviations Include:

†	Federal Government
★	Project of $500,000 or over
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily
A-E-M	Architect-Engineer-Management type of contract

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger; water supply, earthwork, waterworks, $15,000; other public works, $25,000· industrial buildings, $40,000; other buildings, $150,000.

Classes of Construction

(Named in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Unclassified
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings

Stages Reported

PROPOSED: (except Streets & Roads);
BIDS ASKED (new announcements only. For full calendar, see also preceding issues of ENR);
LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Note: To comply with censorship requirements, addresses on some reports are being generalized. Data which would reveal the purpose of the improvements and the size are withheld, the name of contractor and general area are reported.

WATER SUPPLY

PROPOSED WORK

Ill., North Chicago—J. P. Dromey, mayor, WW imprvs. $200,000. Seeking FWA funds. Alvord, Burdick & Howson, 20 N. Wacker Dr., Chicago, engrs.

Minn., Hopkins—Village, surveys water tower. Ralph D. Thomas & Associates, 1200 2 Ave. S, Minneapolis, engrs.

Minn., Luverne—City, E. Thron, supt. Utilities, furnishing, installing water tower. Over $20,000. R. D. Thomas & Associates, 1200 2 Ave. S., Minneapolis, engrs.

Minn., Robbinsdale—Village, C. O. Wallace, clk., City Hall, making surveys deep well, furnishing, installing pump. equip. $25,000. J. B. Harris Co., 416 Essex Bldg., Minneapolis, engrs.

Minn., Sleepy Eye—J. S. Jensen, clk., Village Hall, water tower. Ralph D. Thomas & Associates, 1200 2nd Ave. S., Minneapolis, engrs.

Neb., Crawford—City watermain imprvs., extens. $105,000. Applying for FWA funds. Robert Fulton, 2328 S. 19 St., Lincoln, engr.

†O., Cleveland—U. S. Eng., 925 New Federal Bldg., Pittsburgh, Pa., 100,000 gal. elevated steel water storage tank for Crile Hospital Grounds.

N. S., New Glasgow—Municipality, M. Wadden, clk., furnishing, laying 5 mi. 20 in. water pipe. $200,000.

BIDS ASKED

Bids Asked July 3

†Md., Bainbridge (sta. Port Deposit)—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., imprv. water supply, Naval Training Station, NOY 9226. M. Pirnie, 25 W. 43 St., New York, N. Y., engr. CD 4/24.

Bids Asked July 5

N. Y., New York—Comr. Water Supply, Gas & Electricity, Municipal Bldg., New York, Zone 7, hauling, laying watermains, appurtenances, Roosevelt Ave., Queens Boro. Plans deposit $1.

Bids Asked July 6

Fla., Pensacola—City, c/o Manager, City Hall, installing dual driven 3,500 g.p.m. service pump, chlorine and metering equip., piping, pump. plant bldg. alterations, addns. Yonge & Harte, 614 Blount Bldg., engrs. CD 1/6—ENR 1/13.

N. Y., Niskayuna—Town Bd. in rooms of Fire Station, Balltown Rd., WW sys., Niskayuna Water Dist., 6. Plans deposit $25. Solomon & Keis, 257 Bway, Troy, consult. engrs.; adv. ENR 6/29.

O., Toledo—City, G. N. Schoonmaker, mgr., City Hall, furnishing, installing 7,800 ft. 12 and 24 in. concrete pressure or c.i. pipe. $95,000. Plans deposit $10. O. Clark, 110 Cherry St., engr.

Wash., Longview—D. Wiley Carpenter, city clk., concrete water filter plant, with pump house on Cowlitz River. $125,000. Plans deposit $20. Cunningham & Associates, Spalding Bldg., Portland, Ore., engrs. CD 6/13—ENR 6/15.

Bids Asked July 12

†N. C., Wilmington—City, 4 m.g. rein.-con. storage reservoir at filter plant. W. C. Olsen, 5 Exchange Pl., Raleigh, consult. engr. CD 5/31—ENR 5/25.

†Tex., Dallas—H. A. Hunter, supt. Water, City Hall, Contr. 8, setting equip. to WW imprv. project, Tex. 41-651-N. **FWA.** Plans deposit $15. Koch & Fowler, Great National Life Bldg., Meyers & Noyes, Tower Petroleum Bldg., and Rollins & Forrest, Praetorian Bldg., engrs.

Bids Asked July 17

Fla., Lake Wales—Florida Citrus Canners Cooperative Lake Wales, well with pump. station and pump. equip., repairing, imprv. wells, new pump. equip., etc. Plans deposit $10. Solomon & Keis, 257 Bway., Troy, N. Y., consult. engrs.; adv. ENR 6/29. 6/29.

Pa., Scranton — Scranton-Spring Brook Water Serv. Co., 135 Jefferson Ave., imprv. No. 7 Dam, near here. Plans deposit $5. Thos. H. Wiggin, 90 Broad St., New York, N. Y., consult. engr.; adv.—ENR 6/29.

LOW BIDDERS

Ark., Magnolia—Deep well sys., appurtenant work, from **B. W. Edwards, Hope, $16,695.** Est. $25,000. C. O. Thomas, Hope, engr.

†Tex., Fort Worth—S. H. Bothwell, city mgr., City Hall, June 19, Contr. 2, 15 m.g.p.d. pump. unit, appurtenances for Holly Pumping Station, Tex. 41-641-N, from **A. M. Lockett & Co., Magnolia Bldg., Dallas, $16,099.** Est. $25,000. **FWA.** CD 5/26—ENR 6/1.

Tex., Houston—City, c/o M. H. Westerman, secy., City Hall, June 21, 8 in c.i. watermain in Holman Ave. and Tuam St., incl. fittings, valves, fire hydrants, etc., from **J. Lockhart, 1006 Travis Bldg., $28,954.**

CONTRACTS AWARDED

Ark., Camden—Intake supply pipe and high service pump. station, to **Boh Bros. Constr. Co., 2400 Cypress St., New Orleans, La., $19,909.** CD 5/22—ENR 5/25.

Ga., Columbus—Bd. Comrs. Muscogee Co., WW sys., to **J. B. McCrary Co., 22 Marietta St. Bldg., Atlanta, $135,855.** CD 5/19—ENR 5/22, under LB.

†S. C., Fort Moultrie (P. O. Moultrieville)—U. S. Eng., Post Office Bldg., Savannah, Ga., deep well, Contr. 09-133-eng-213, to **Layne-Atlantic Co., Cromwell Rd. and Flanders Ave., Norfolk, Va., $19,127.**

†Tex., Big Spring—B. J. McDaniels, city mgr., City Hall, Contr. 1, 8 water wells, to **G. L. Taylor, 1201 W. 11 St., Plainview, $37,887;** Contr. 3, pipelines, to **Dalton & Cullum, Great National Life Bldg., Dallas, $454,212,** both Tex. 41-672-N. **FWA.** CD 6/8.

★†Tex., Seagoville—Dpt. Justice Immigration & Naturalization Service, eagoville, water supply well, to **Layne-Texas Co., 3901 Elm St., Dallas, $27,258.**

†Utah, Tooele—Tooele City, c/o City Clerk, rein.-con. water tank, 10,000 ft. pipeline, to **Young & Smith Constr. Co., 1st Natl. Bank Bldg., Salt Lake City, $72,500. FWA.** Bids 6/5. CD 5/29—ENR 9/30.

SEWERS, WASTE DISPOSAL

PROPOSED WORK

Minn., Jasper—Village, sewerage sys., disposal plant. $75,000. Perkins & McWayne, Sioux Falls, S. D., engrs.

O., Cambridge—Village, V. F. Ross, mayor, surveys sewage treatment plant. Floyd G. Browne & Assoc., Marion Bldg., Marion, consult. engr.

Wis., Portage—City, Mrs. Frances Wright, clk., imprv. sewage treatment plant, incl. new digester, 2 new rein.-con. settling tanks, collector equipment pipe changes, etc. $30,000. General Engineering Co., Portage, engrs.

★B. C., Vancouver—City, J. W. Cornett, mayor, 453 12 Ave., will submit $500,000 to $750,000 by-law Dec. 13, to ratepayers, for sewer and WW extens. C. Brakenridge, 453 W. 12 Ave., engr. CD 6/20—ENR 6/22.

BIDS ASKED

Bids Asked July 7

†Calif., La Mesa—City Clerk, City Hall, 4757 Spring St., sanitary sewer between here and San Diego, Calif. 4-148. Over $25,000. Plans deposit $10. CD 4/28—ENR 5/4.

O., Ravenna—City, C. P. Likens, Service Dir. City Hall, Contr. 2, sewage treatment plant, 25x35 ft., brick pump house, 1,900 ft. 14 in. inverted siphon and primary treatment plant. $100,000. Plans deposit $10. Floyd Browne & Associates, Marion Bldg., Marion, engrs. CD 5/17—ENR 5/25.

Bids Asked July 12

Calif., Los Angeles—Bd. P. Wks., City Hall, sanitary sewer in Centinella-Mitchell Ave. Sewer Dist. $103,067. L. Aldrich, City Hall, engr.

†S. C., Summerville—Town, sanitary sewage collecting sys. and disposal plant, SC 38-133 NF. Tentative date. Bids 6/14 rejected. Tomlinson Eng. Co., 1226 Sumter St., Columbia, engrs. CD 6/20—ENR 6/22.

†Tex., Dallas—Mayor & City Council, E. Goforth, city secy., installing vertical sewage pump and motor, wiring, sewage discharge piping and removal sewage pump and motor, sewage discharge piping, wiring, etc., Contr. 8, Tex. 41-651. **FWA.** Plans deposit $25.

Bids Asked July 14

†Md., Hyattsville—At office Washington Suburban Sanitary Comn., Hamilton St., 7,660 ft. 6- to 18-in. vitr. sewers, Contr. 173-S. Plans deposit $5. P. Boswell, J. D. Clagett, and F. B. Smith, comrs.; adv. ENR 6/29.

Bids Asked July 18

Calif., Los Angeles—Bd. Supervs. Los Angeles Co., 501 Hall of Records, Los Angeles, sewer in Quinn St., etc. C.I. 1085.

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SEWERS, WASTE DISPOSAL (Bids Asked Cont'd.)

Calif., Los Angeles—Bd. Supervs. Los Angeles Co., Hall of Records, sanitary sewer in Santa Ana Blvd., etc., C.I. 1067. $35,000. Plans deposit $7.50. A. Jones, Hall of Records, co. engr.

Bids Asked July 18

Ind., Fort Wayne—Bd. P. Wks., R. G. Beams, chn., City Hall, interceptor sewer Beaver Ave. Area. $70,000. City Utilities, 308 E. Berry St., engrs.

Bids Asked

†Mass., Fort Ruckman (P. O. Nahant)—U. S. Eng., 31 St. James Ave., Boston, (selected list bidders) drainage, No. 19-023-44-NEG 222. $5,000.

LOW BIDDERS

Calif., Los Angeles—City, Bd. P. Wks., City Hall, June 14, sanitary sewer in Erwin St. between Fair and Tujmunga Aves., from B. Bosnyak, 1438 Kellam Ave., **$28,913.** CD 5/16—ENR 5/18.

Ind., Fort Wayne—Bd. P. Wks., interceptor sewer Bloomingdale Area, Hensch St., from Fry & Kain Constr. Co., 411 W. Gier St., Lansing, Mich., **$75,566.** Est. $87,190. CD 9/20—ENR 9/23.

CONTRACTS AWARDED

†Mich., Roseville—Wm. Utt, village clk., Village Hall, 27700 Gratiot Ave., 16,153 ft. 6- to 18-in. sanitary sewers, Mich. 20-323 to A. Di Ponio, 16595 Prest St., Detroit, **$40,126. FWA.** H. R. O'Mara, 2557 National Bank Bldg., Detroit, engrs.

Miss., Pascagoula — City, W. R. Gulley, mayor, sewerage sys. plant, to Brice Building Co., 215 S. 18 St., Birmingham, Ala., **$64,000;** addnl. sewage sys. lines, to J. B. McCrary Co., Citizens Bank Bldg., Atlanta, Ga., **$55,000.**

†N. J., Millville—U. S. Eng., Penn Mutual Bldg., 6 and Walnut Sts., Phila., Pa., sewer and water lines at Millville Air Base, to J. N. Driscoll Co., 27 E. Durham St., Phila., Pa., **$58,500.** Bids 6/5.

†Va., Virginia Beach — Federal Works Agency, 601 State—Planters Bank Bldg., Richmond, Zone 19, 4,940 ft. 21 in. vitr. clay sewer from 40 St. and Pacific Ave. to sewage pump. sta. near 29 St. and Arctic Ave., Va. 44-395, to S. T. George Co., Norfolk, **$41,908.**

Wis., Milwaukee—City, Dpt. P. Wks., sewers W. Burnham and in W. Clarke Sts., to Mierswa Const. Co., 2778 N. Avondale St., Zone 10 **$30,420.** Bids 6/19. J. P. Schwada, city engr.

BRIDGES

PROPOSED WORK

O., Cleveland—Reconstructing Washington Park Bridge, $30,000.

South Carolina—State Hy. Dpt., Columbia, movable span 733 ft. hy. bridge, 31 ft. wide over Ashley River on proposed cut-off between Route 52, near North Charleston and Route 17 at Red top, approx. 650 ft. upstream from Atlantic Coast Line R. R. bascule bridge, near Drayton, approx. 12 mi. above mouth of Ashley River in Charleston Harbor, Charleston Co. Applied to War Dpt. for approval of plans. J. S. McMillan, Columbia, engr.

†Tennessee—Tennessee Valley Auth., c/o Purchasing Agent, Knoxville, bridge over Clinch River, incl. approaches, easements, Clairborne and Grainger Counties.

BIDS ASKED

Bids Asked July 5

Louisiana—State Hy. Dpt., Baton Rouge, reconditioning 0.699 mi. 13 timber pile trestles and other work, on Pearl River—Mississippi State Line Hy., State Route 2, S.P. 18-04-10 and 18-05-02, F.A.F. SN-A-FAP 126-B(2), SN-A-FAP 126-D(2) and SN-A-FAP 175(2), St. Tammany Parish.

Bids Asked July 6

★ **Virginia**—State Hy. Dpt., Richmond, 1.07 mi. bridge over Clinch River and 1.07 mi. macadam surfacing, Route 80, S.P. S-556-A1-B1, Russell Co.

Bids Asked July 7

Alabama—G. R. Swift, dir. State Hys., Montgomery, grading, draining, paving, bridge and bridge tenders' residence on 0.234 mi. Intracoastal Canal between Foley and Gulf Shores, Baldwin Co.; removing structures on Brundidge-Clio Rd., Pike Co.

Kentucky—State Dpt. Hys., Frankfort, Tennessee River Bridge near Paducah Electric Navigation Lighting Sys., Proj. MP 73-32-TB-2, McCracken Co.

Missouri—State Hy. Comn., Jefferson City, three 45 ft. rein.-con. deck girder spans over C.B. & Q.R.R., Sta. 132 plus 30, Route 500, FAGM FAGS-A(1), from Municipal airport to St. Joseph, Buchanan Co.; 40 ft. spandrel filled arch

BRIDGES (Bids Asked, Cont'd.)

over River des Peres, Sta. 980 plus 2 Route 40 TR SN-FA 623 B(2), from Lay Road, North and South Rd., St. Louis Co.; two 62 ft. multiple concrete frame bridge, 4 lane pavement over Route 40 TR, Sta. 960 plus 14, at McCutcheon Rd., TR-SN-FA 623 B(2), from Lay Rd. North and South Rd., St. Louis Co. Over $25,000 each. C. S. Brown, ch. engr.

Bids Asked July 13

Washington—B. Bantz, dir. Hys., Olympia, reconstructing 152 ft. timber bridge undercrossing, carrying Coleman Rd. over Primary State Hy. 9, near Port Angeles, Clallam Co.; cleaning, painting steel spans on Secondary State Hy. 1-L, Merril and Ring Creek near Mukilteo, Secondary State Hy. 15-B, Skykomish River, near Monroe, both Snohomish Co., Primary State Hy. 5, White River near Enumclaw, King Co., steel spans of bridge over Yakima River, Secondary State Hy. 11-A, near Yakima, Yakima Co.

Bids Asked July 18

O., Shaker Heights—Comrs. Cuyahoga Co., F. Husak, clk., Court House, repairing asphalt resurfacing bridges over Rapid Transit Sys. at Green, Richmond and Warrensville Center Rds. $38,300. M. Friedman, 1926 Standard Bldg., Cleveland, engr.

LOW BIDDERS

California—State Div. Hys., Sacramento. June 21, rein.-con. box culvert and timber trestle bridge, Humboldt Co., from Mercer-Fraser Co., 2nd and Commercial Sts., Eureka, **$55,736.** CD 6/1—ENR 6/8.

Connecticut—State Hy. Comn., Hartford. June 19, widening 2 Route 188 and 1 Route 63 bridges, Middlebury, from Brunalli Constr. Co., Main St., Southington, **$27,974.** CD 6/13—ENR 6/15.

CONTRACTS AWARDED

Oregon—State Hy. Comn., Salem, 4 bridges, Halsey-Harrisburg Sect. Pacific Hy. East, Linn Co., to F. Watt, 2020 NE 58 St., Portland, **$59,190.** Bids 6/14.

Que., Compton—Bridge to Maurice Gagnow and A. Maurice, Coaticook. Est. **$30,000.** Dpt. P. Wks., Quebec City, engr.

STREETS AND ROADS

BIDS ASKED

Bids Asked July 3

Ia., Spencer—Bd. Supervs. Clay Co., graveling 9½ mi. and maintenance graveling 40 mi. various secondary roads, involving 23,400 cu. yd. gravel, 1 mi. haul, 171,600 units of addnl. ½ mi. haul. Over $25,000. F. Campbell, Spencer, co. engr.

Bids Asked July 5

South Carolina—State Hy. Dpt., J. S. Williamson, comr., Columbia, grading, asphaltic concrete surfacing 3.086 mi. from Charleston Army Air Base to Charleston Port of Embarkation, Route 525, Co. Road and spur on Route 206, Defense Access Proj. DA-WR 36-A (1), Parts 1, 2, 3 and 4, Charleston and Berkeley Counties; grading, asphaltic concrete on macadam surfacing 0.795 mi. being approaches to Santee Tail Race Canal bridge near Moncks Corner, Route 52, S. C. Docket No. 8,257. F.A. 63-A, Berkeley Co.

Bids Asked July 6

Ia., Primghar—Bd. Supervs. O'Brien Co., constructing, maintenance graveling various secondary roads. Over $25,000. W. L. Anderson, Primghar, co. engr.

Pennsylvania—State Dpt. Hys., Harrisburg, bituminous resurfacing, crushed aggregate base widening and bituminous surfacing existing pavement, 1.92 mi. U. S. Route 6, Traffic Route 14, Troy Twp., Bradford Co.; crushed aggregate base widening existing pavement and bituminous surfacing new base, resurfacing bridge floors, etc., 1.08 mi. Traffic Route 49, Westfield Twp., Westfield Boro, Tioga Co., Bids 6/6 rejected, CD 6/8—ENR 6/15 under LB; bituminous surfacing 3.02 mi. U. S. Route 219, East Taylor Twp., Johnstown City, Cambria Co.; 1.25 mi. Rural Route 46107 and U. S. Route 422, Conshohocken Boro, Springfield and Whitemarsh Twp., Montgomery Co.; 0.92 mi. Rural Route 37013 and U. S. Route 422, New Castle, Lawrence Co.; rein.-con. paving, shoulder grading, rein.-con. bridge 0.07 mi. U. S. Route 122, Parkesburg Boro, Chester Co.; bituminous surfacing, incl. replacing portions existing granite block pavement with concrete base for adjustments, 2.44 mi. Rural Routes 67029, 67009 and 67030, Ridge Ave., Phila., Phila. Co.; repairing bridge over Youghiogheny River, Rural Routes 26069, 55113 and Traffic Route 281, Henry Clay and Addison Twps., at Confluence, Fayette and Somerset Counties; painting 4 bridges on Rural Routes 03043 and 64031 and Traffic Routes 66, 993 and 156, in Kiskiminetas, Bell, Washington and North Huntingdon Twps., Avonmore and Apollo Boroughs, Armstrong and Westmoreland Counties.

Virginia—State Hy. Dpt., Richmond, 2.93 mi. stabilized base, and 0.66 mi. waterbound macadam surfacing Int. Rt. 360 near Whites Mill and 1.6, mi. west Appomattox River, Routes 148 and 360, S.P. DA-WR 140,-D1, B1 and S-659DR1, F. P. DA-WR 29-A(1), Amelia Co.; gravel surfacing 0.53 mi. Route 3, S.P. S-433-D, Stafford Co.

Washington—B. Bantz, dir., State Dpt. Hys., Olympia, manufacturing, stockpiling crushed stone surfacing and mineral aggregate, Primary State Hy. 1, Deming to Shuksan, Whatcom Co.; Primary State Hy. 3, Sec. 1, Colfax to Snake River Bridge and Sec. 2, Palouse North to Colfax, Whitman Co.; Sec. 1, Primary State Hy, 3, Colville to Kettle Falls, Stevens Co.; Sec. 2, Primary State Hy. 6, Ione to Metaline Falls, Pend O'Reille Co.; Sec. 3, Primary State Hy. 22, Cedonia to Marcus, Stevens Co.; Sec. 4, Secondary State Hy. 4-B, Odessa North, Lincoln Co.; ballasting, surfacing, constructing light bituminous surface treatment 6.2 mi. Secondary State Hy. 11-C, Lamont to Imbler Creek, Whitman Co. Plans deposit $2.

Bids Asked July 7

Kansas—State Hy. Dpt., Topeka, single asphalt surface treating 5.004 mi. Proj. 2265 AB, and 4.196 mi. P. 2626 AB, Cloud Co., 15.445 mi. P. 2592 AB, and 6.427 mi. P. 2608AB, both foregoing Jewell Co.; 34.583 mi. P. 2633 ABC, Lincoln Co., 13.886 mi. P. 2635 AB, McPherson Co., 8.355 mi. P. 2594 AB, Mitchell Co., 0.573 mi. P. 2932, and 11.944 mi. P. 2636, Ottawa Co.; 12.288 mi. resurfacing material on 12.288 mi. P. 2627, Dickinson Co., 8 mi. P. 2605; 12.255 mi. P. 2628; 13.931 mi. P. 2629, 5.671 mi. P. 2630; 5.2 mi. P. 2629, foregoing in Ellsworth Co.; 10.701 mi. P. 2607, Geary Co.; 16.223 mi P. 2639; 15.431 mi. P. 2631, both Jewell Co.; 12.04 mi. P. 2632, Lincoln Co.; 5.4 mi. P. 2634, Marion Co.; 3.1 mi. P. 2612, McPherson Co.; 4.4 mi. P. 2614, Mitchell Co., 2.057 mi. P. 2616 AB, Morris Co., 8.63 mi. P. 2637, Republic Co. R. C. Keeling, Topeka, engr.

Kentucky—State Dpt. Hys., Frankfort, bituminous surfacing 10.456 mi. Murray-New Concord-Tenn. line Rd., from New Hope Church to Tennessee line, S. P. 18-63, Calloway Co.; grading, drainage 0.8 mi. London-Barbourville Rd. from end of improved section to Boreing, SP 63-91, Laurel Co.; grading, draining, light surfacing, 2.391 mi. Salyersville-Prestonburg Rd. from end of improved road near Ivyton to Floyd Co. line, FAS 267 C(1), S.P. 77-40, Magoffin Co.; 3.2 mi. Hellier-Ashcamp Rd. from jct. with Ky. 193 at Hellier to jct. with Ky. 197 at Ashcamp, Proj. DA-RM 43 SP 98-463, Pike Co.; 2.5 mi. Mine Access Rd. on Bowling Fork from jct. with Ky. 195 near Henry Clay to headwaters of branches flowing into Bowling Fork, Proj. DA-RM 42 SP 98-443. Pike Co.; bituminous resurfacing 0.662 mi. Newport- Caryville (Licking Pike) Rd. from SCL of Newport and exten. south, SP 19-131, Campbell Co.; 1.8 mi. RH 1172 Veach Rd. from Ky. 71 at Owensboro to entrance to Country Club, RH 1175 East 18 St. from end of concrete to bituminous resurfacing. The Daniels Rd. from US 60, 1.6 mi. east of Owensboro to 650 ft. south of L&N Railroad (RH 1124) Group RH 3, Daviess Co.

Mass., Dorchester—City, sheet asphalt paving E. Cottage and Pleasant Sts. $40,000. Plans deposit $2 each set.

Missouri—State Hy. Comn., Jefferson City, grading 22 in. concrete paving 0.568 mi. Route 500, road from municipal airport to St. Joseph, FAGM-FAGS-A(1), Buchanon Co.; 0.712 mi. Route 40 TR-SN-FA 623-B (2), from Lay Road north and South Rd., St. Louis Co.; grade approaches to Lauter River Bridge, rock fill, Route 19-43F-FA 141-B (2) 2 from Highway 50 west to Jefferson city, Montgomery Co.; seal coat 20.326 mi. Div. 4 Group 1, in Pettis and Saline Counties; 7.746 mi. Div. 4, Group 2, Jackson and Platte Counties; oiled earth 31.151 mi. Div. 4, Group 3 Hiney, Lafayette and Platte Counties; bituminous material surfacing 1.59 mi. Route 40-M1 road from Foristell to Wentzville, St. Charles Co.; to St. Charles Co. Over $25,000. C. W. Brown, ch. engr.

Bids Asked July 10

Miss., Indianola—City, City Hall, repairing, constructing new surface treatment 29,798 sq.yd. pavement. Plans deposit $5. Abbott Eng. Co., Greenwood, engrs.

Bids Asked July 11

†N. Y., Bath—Veterans Admin., 18 and F Sts. N.W., Wash., 25, D. C., road construction, Proj. 2175.

Bids Asked July 12

California—State Div. Hys., Sacramento, plant mix surfacing 2.6 mi. between Napa and Yountville, Napa Co.; 4.6 mi. between Biggs Rd. and Oroville Wye, Butte Co. G. T. McCoy, Pub. Wks. Bldg., Sacramento, state hy. engr.

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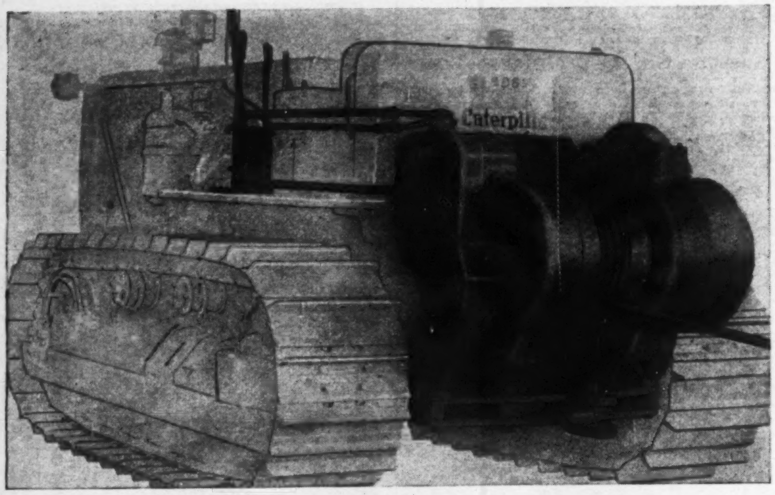

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STREETS & ROADS (Bids Asked, Cont'd.)

Bids Asked July 13

Washington—B. Bantz, dir. Highways, Olympia, grading, selected roadway borrow surfacing, constructing 200 ft. thru steel truss span, timber pile trestle approaches across Methow River on Primary State Hy 16, 1.455 mi., Okanogan Co.

Bids Asked

†Mass., Orange—U. S. Eng., [illegible] Industrial Trust Bldg., Providence, R. I. (selected list bidders), imprv. access roads and extend. drainage sys., airport No. 4-97.

Missouri—State Hy. Comn., Jefferson City, rejected bids June 12, imprv. 18.3 mi. Butler Co.; 19.365 mi. Lewis, Marion and Scotland Counties; 38.5 mi. Chariton, Schuyler and Adair Counties; 9.8 mi. Jackson and Pettis Counties. C. W. Brown, Jefferson City, engr. CD 6/1.

Sask., Kisbey—W. M. Kehoe, secy. rural Municipality of Brocke, Kisbey, graveling 15 mi.

LOW BIDDERS

California—State Div. Hys., 808 State Bldg., Los Angeles, June 15, imprv. 4.4 mi. Orange Co., from Sully-Miller Contr. Co., 1500 W. 7 St., Long Beach, $66,155***7.1 mi. Ventura Co., from R. R. Hensler, 816 Allen St., Glendale, **$66,675*****7.8 mi. San Diego Co., from Southwest Paving Co., 11402 Tuxford St., Roscoe, **$50,045**. G. T. McCoy, state hy. engr. CD 5/31.

California—State Div. Hys., Sacramento, June 21, imprv. 0.7 mi. Del Norte Co., from Mercer-Fraser Co., 2 and Commercial Sts., Eureka. **$55,736.** CD 6/1—ENR 6/8.

Delaware—State Hy. Dpt., Dover, June 21, furnishing, applying asphaltic material, New Castle Co., Contr. 862, from Asphalt Service Co., 3436 Shell Rd., Baltimore, Md., **$31,156*****Sussex Co., Contr. 864, from Delmarva Asphalt Co., Seaford, **$38,640**. CD 5/29—ENR 6/1.

D. C., Wash.—District Comrs., District Bldg., June 16, grading approx. 100,000 cu. yd. streets, roads, avenues and alleys, from American Excavating Corp., Vienna, Va., **$43,500.** CD 6/12.

Indiana—S. C. Hadden, chn. State Hy Comn., Indianapolis, June 20, imprv. 1.29 mi. Spencer Co., from R. P. Olinger, Huntingburg, **$81,739,** est. $95,140***18.461 mi. La Porte Co., from Calumet Engineering Co., Hammond, **$41,899,** est. $43,009. Received no bids June 20, imprv. 5.617 mi. Contr. 2328, Allen Co., will readvertise. CD 6/13-ENR 6/15.

Mass., Boston—Comr. P. Wks., City Hall, June 21, sheet asphalt paving Kneeland St., Ward 3, from Washington to Utica Sts., from Walter Reed Corp., 1078 Boylston St., **$28,625.** CD 6/15.

Mass., Boston—City, June 23, imprv. Beacon St., from Baker & Co., 1335 Hyde Park Ave., Hyde Park, **$45,295.** CD 6/15.

Nebraska—State Dpt. Roads & Irrigation, Lincoln, June 15, imprv. 7 mi. Gage Co. and 7.8 mi. Otoe Co., from Lee & Johnson, Inc., 215 Insurance Exchange Bldg., Sioux City, Ia., **$51,791** and **$48,146** respectively ***6.3 mi. Madison Co., from Inland Constr. Co., 3867 Leavenworth St., Omaha, **$53,911** ***9.8 mi. Sherman and Buffalo Counties, from Northwestern Engr. Co., Rapid City, S. D., **$95,316*****6.3 mi. Madison Co., from Norfolk Br. & Constr. Co., Norfolk, **$26,793**. CD 6/6.

North Carolina—State Hy. & Pub. Wks. Comn., Raleigh, June 22, imprv. 0.88 mi. New Hanover Co., from F. D. Cline, Fairview Rd., Raleigh, **$31,325**; 10.644 mi. Wilson Co., from Brown Paving Co., Lexington, **$93,592**.

★ **Ohio**—State Hy. Dpt., Columbus, June 13, from Ohio Road Imprvt. Co., Chamber of Commerce Bldg., Columbus, imprv. 2.509 mi. Trumbull Co., **$48,417,** est. $50,730; 3.393 mi. Portage Co., **$42,799,** est $50,160; 57.17 mi. Auglaize, Darke and Shelby Counties, **$42,220,** est. $42,894***from Bowsman Washed Sand & Gravel Co., Box 506, Troy, 11.296 mi. Miami and Montgomery Counties, **$180,188;** 5.975 mi. Miami and Shelby Counties, **$64,319,** est. $74,930***from Boyd & Cook Co., Gas & Electric Bldg., Dayton, 4.59 mi. Montgomery Co., **$83,895**, est. $83,900*** from Robert J. Dienst Co., 297 S. High St., Columbus, 4.007 mi. Athens Co., **$62,800,** est. $65,800***from Frantz Bros., Box 27, Sidney, 1.203 mi. Morgan Co., **$83,592*****from Greenville Bituminous Products Co., Greenville, 48.79 mi. Darke and Mercer Counties, **$34,958,** est. $37,563*** from McCourt Constr. Co., 1000 Hazel Ave., Akron, 1.86 mi. Summit Co., **$41,449,** est. $44,650***from D. D. Mullett, 4353 Murray Ave., Pittsburgh, Pa., 6.555 mi. Portage Co., **$107,208,** est. $138,400***from Muskingum Valley Asphalt & Supply Co., 226 Masonic Bldg., Zanesville, 2.93 mi. Noble and Washington Counties, **$66,849,** est. $67,900*** from Ohio Engineering Co., 105 Sixth St., Lorain, 1.272 mi. Lorain Co., **$31,085,** est. $31,200***from C. J. Shelby, Thornville, 28.89 mi. Knox and Licking Counties, **$45,752,** est. $46,285***from Southern Ohio

EET & ROADS (Low Bidders, Cont'd.)

rries Co., 150 E. Broad St., Columbus,
mi. Adams and Brown Counties, **$64,-**
est. $66,630; 26.78 mi. Adams and
to Counties, **$67,854**, est. $69,095. No
received imprv. 12.33 mi. Lawrence
Scioto Counties, $35,245; cancelled bids
have been opened June 13, imprv. 6.218
Trumbull Co. $88,900.

Pennsylvania—J. U. Shroyer, secy. State
Dpt. Hys., Harrisburg, June 20, imprv.
mi. Washington Co., from D. D. Mullett,
Liberty Ave., Pittsburgh, Zone 1, **$166,-**
**3.17 mi. Greene Co., from Standard
nstr. Co., Waynesburg, **$200,609***** 1 mi.
ntgomery Co., from Louis Dolente &
s, 5122 Master St., Phila., **$78,978***** 5.21
Northampton Co., from Walker Bros.,
ambersburg, **$216,889*****imprv. 0.15 mi.
concrete deck I-beam bridge, Beaver
from Holmes Constr. Co., 443 Palmer
Wooster, O., **$62,504*****1.24 mi. surfac-
for bridge approaches and 5 rein.-con.
dges, Washington Co., from Cornish &
ckerson Coal Co., Uniontown, **$221,545*****
mi. hy., 4 rein.-con. bridges, Greene and
shington Counties, from C. Balazick,
ferson, **$117,993.** CD 6/1 and 6/7 and
R 6/8 and 6/15, under Bridges and Streets
Roads.

Texas—State Hy. Comn., B. P. Gentry,
, Austin, June 22, imprv. 19.597 mi.
xar and Guadalupe Counties and 15.609
Nolan Co., from Holland Page, George-
n Rd., Austin, **$98,769** and **$33,521** re-
ctively, est. $100,000 and $35,000 re-
ctively***2.738 mi., and 2.503 mi. Bexar
, from Colglazier & Hoff, 326 Sequin Rd.,
Antonio, **$35,913** and **$53,913** respectively,
$40,000 and $55,000 respectively***
815 mi. Anderson Co., from Haden &
stin, 5009 Fannin St., Houston, **$35,440,**
$40,000***13.363 mi. Bowie and Cass
unties, from Austin Road Co., 1813
arence St., Dallas, **$34,452,** est. $35,000***
055 mi. Brazos Co., from Campbell & Kay,
ler, **$42,970,** est. $40,000. Received no bids
ne 22, imprv. 14.425 mi. Parker Co. CD
13—ENR 5/16.

NTRACTS AWARDED

Alabama—State Hy. Dpt., Montgomery,
prv. 15.203 mi. Clay and Randolph Coun-
s, to Vandigriff Constr. Co., 1708 N. Court
, Montgomery, **$25,372*****19 mi. Conecuh
, to A. L. Crow Constr. Co., 111-41 St.
Birmingham, **$54,972*****14 mi. Blount and
owah Counties, to J. E. Milam Constr.
, 8940 First Ave. S., Birmingham,
7,041***7.692 mi. Dallas Co., to E. J. &
L. Cobb, Inc., Bell Bldg., Montgomery,
9,663. Grand total $187,048. Bids 6/16.
6/9—ENR 6/15.

Calif., **Burbank**—Lockheed Aircraft Corp.,
05 Victory Pl., asphalt and concrete pav-
g, concrete curbs and walks, at plant, to
riffith Co., 1060 S. Bway., Los Angeles,
2,970. Awarded 6/22.

Calif., San Francisco—Dpt. P. Wks., City
all, repairing Mission St. between 20 and
Sts., concrete parking lane, to M. J.
ynch, Barneveld and Oakdale Aves.,
0,793. J. J. Casey, City Hall, city engr.

Colorado—State Hy. Dpt., Denver, imprv.
561 mi., and two 200 ft. span steel trusses
State Hy. 4, Mesa Co., to A. S. Horner
nd Lowdermilk Bros., 118 Pecos St.,
enver, **$208,168.** Bids 6/21. CD 6/9—ENR
/15.

†Colo., Pueblo—U. S. Eng., 909 17 St.,
enver, paving, drainage at Pueblo Ordnance
epot, to Peter Kiewit Sons Co., 1099 S.
ogan St., Denver, **$136,000.** CD 6/21, under
B.

D. C., Wash.—District Comrs., District
Bldg., concrete paving, repairing bitumin-
us paving, Sec. A, to Highway Engrg. &
onstr. Co., 7 and T Sts. N.W., **$31,032.**

Idaho—At office Commissioner P. Wks.,
oise, bituminous surfacing 5 mi. hy. near
rco and seal coating 19.16 mi. hy. between
rco and Craters of the Moon, Butte Co.,
Morrison-Knudsen Co., 319 Bway., Boise,
39,967. Est. $46,000. Bids 6/16. CD 6/9.

Kansas—State Hy. Dpt., Topeka, stabiliz-
ng 3.327 mi. DA-WR 34, Morris Co., to
. J., Forster, Ottawa, **$32,269.** Bids 5/29.
. C. Keeling, Topeka, ch. engr.

†Ky., Richmond—U. S. Eng., 522 U. S.
ost Office & Courthouse, Cincinnati, O.,
oads, bldg. and parking area, Blue Grass
rdnance Depot, Contr. 33-015-eng-519, to
ilson & Taylor, 755 E. 3 St., Lexington,
st. **$39,996.**

Minnesota—State Hy. Dpt., St. Paul,
mprv. 5 mi. S.P. 3901-06 (T.H. 11-11), to
. L. Nelson Co., Brainerd, and R. C. Jones,
eerwood, **$54,781*****6.9 mi. S.P. 7002-13
(T.H. 21-13), to J. Roth Const. Co., 350
West Idaho St., St. Paul, and O. W. Braske,
111 15 Ave. SE, Minneapolis, **$41,355*****
12.3 mi. S.P. 5809-03 (T.H. 66-186) and
S.P. 5803-16 (T.H. 23-185), to Woodrich
onstr. Co., 405 Lumber Exchange Bldg.,
Minneapolis, **$96,814*****20.6 mi. S.P. 6405-14
(T.H. 4), to Megarry Bros., St. Cloud, **$99,-**
780***17.4 mi. S.P. 0906-17 (T.H. 33-164)
S.P. 6911-08 (T.H. 33-164), and S.P. 3805-

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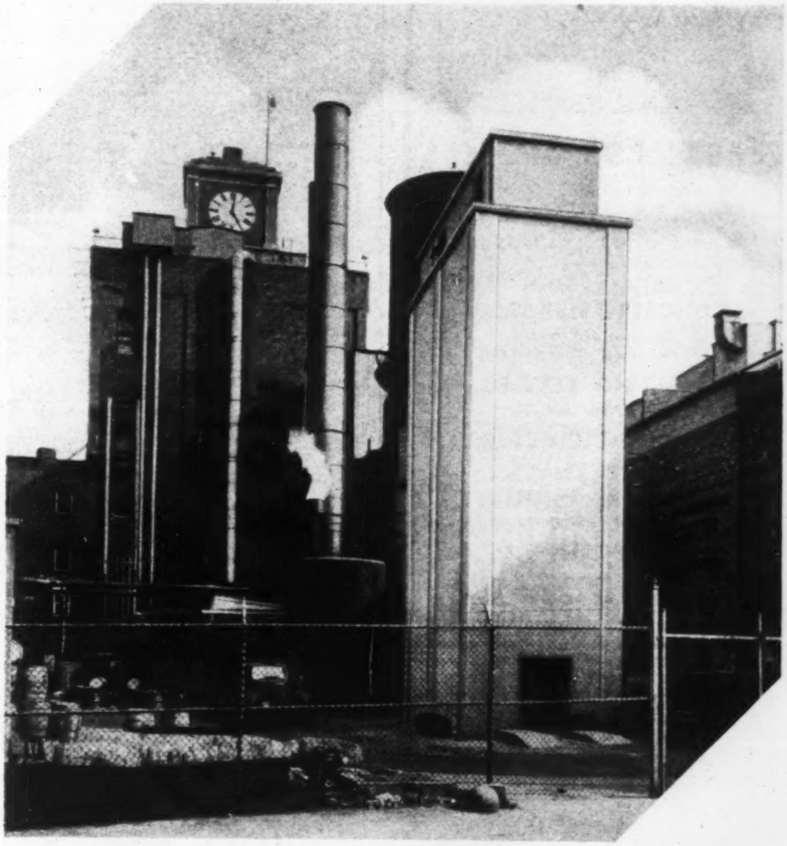

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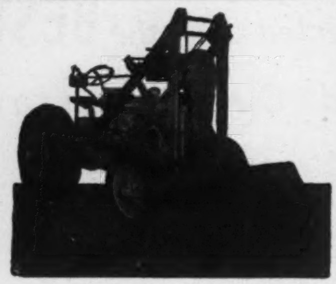

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STREETS & ROADS (Contracts Awarded, Cont'd.)

25 (T.H. 61-1), to Ulland Bros., Austin. **$134,818.** Grand total $427,548. CD 5/24—ENR 6/1.

Minnesota—State Hy. Dpt., St. Paul, imprv. 12.8 mi. S.P. 0709-10 (T.H. 60-60) S.P. 4006-21 (T.H. 60-60); and 3.2 mi. S.P. 7206-132 12 (T.H. 19-100), to J. Brown and Lundin Bros., Mankato, **$69,964** and **$36 033** respectively***19.4 mi. S.P. 4203-09 (T.H. 23-17) and S.P. 8701-15 (T.H. 23-17), to G. D. Alexander, 1100 3rd Ave. S., Minneapolis, **$104,116*****7.3 mi. S.P. 6607-19 (T.H. 60-21) and S.P. 6612-22 (T.H. 218-1), to J. Roth Constr. Co., 250 West Idaho St., St. Paul, and O. W. Braske, 1111 15 Ave. S.E. Minneapolis, **$38,556.** Grand total $248,-669. Bids 6/2. CD 5/24—ENR 5/25. Rejected bids imprv. 8.2 mi. S.P. 2905-11 (T.H. 71-4); 15.1 mi. S.P. 6010-18 (T.H. 75-6); 6.1 mi. S.P. 8607-17 (T.H. 55-188).

Minnesota—State Hy. Dpt., St. Paul, screening, loading and hauling 1,500 cu. yd. and crushing, screening, loading and hauling about 14,377 cu. yd. mineral aggregate for bituminous surfacing Maintenance Div. (Bemiaji Dist.), to C. L. Nelson Co., Brainerd, **$31,958,** Bids 5/29; crushing, screening, loading and hauling about 38,835 cu. yd. mineral aggregate for bituminous surfacing for Maintenance Div. (St. Cloud Dist.), to W. Hodgman & Sons, Fairmont, **$69,719.** Bids 5/31.

Neb. Columbus—C. H. Hoge, clk. Platte Co., graveling roads, to Gerhold Co., Columbus, **$29,278.** Bids 6/2.

New Mexico—State Hy. Dpt., Santa Fe., imprv. 59.1 mi. Guadalupe and Quay Counties, also crushing Contr. 2, Dist. 5, Santa Fe, San Miguel and Torrance Counties, to M. M. Sundt Constr. Co., 523 W. Coolidge St., Albuquerque, **$29,890** and **$36,331** respectively; imprv. 5.399 mi. Eddy Co., to Brown Bros., 3525 N. 4 St., Albuquerque, **$33,002.** Grand total $99,223. Bids 6/23. CD 6/14.

N. Y., New York — President Manhattan Boro, Municipal Bldg., Zone 7, imprv. 67, 87 and 107 Sts., Contr. 1, to Venetian Constr. Co., Bareto St. and Rayawa Ave., Zone 59, **$34,795**; Contr. 2, W. 51, W. 74, W. 75, W. 85 and W. 89 Sts., Contr. 3, Charles, 36 and 146 Sts., and Contr. 4, Walker, W. 53 and E. 53 Sts., to Sicilian Asphalt Paving Co., 41 Park Row, Zone 7, **$100,031.** CD 6/12—ENR 6/15.

N. C., Raleigh—Asphalt surfacing streets, to F. D. Cline, Fairview Rd., **$143,230.** Informal bids 6/22.

★**North Dakota**—J. S. Lamb, comr. State Hy. Dpt., Bismarck, imprv. 17.9 mi. Griggs and Steele Counties, and 8.5 mi. Walsh Co., to Inland Constr. Co., 3867 Leavenworth St., Omaha, Neb., **$248,616** and **$164,393** respectively***6.5 mi. Traill Co., to P. A. Bradbury, Aberdeen, S. D., **$92,957*****50 mi. Grand Forks and Traill Counties, to Butler Constr. Co., 911 N. 6 St., Grand Forks, **$29,679;** 44.3 mi. Wells Co. and 97.6 mi. Barnes, LaMoure, Dickey, Ransom and Sargent Counties, to Wm. Collins Co., Fargo, **$31,709** and **$45,106** respectively. Grand total $612,460. Bids 6/16. CD 6/6—ENR 6/8.

O., Berea — Comrs., Cuyahoga Co., F. Husak, clk., Court House, Cleveland, resurfacing Bagley Rd. from County line to Columbia Rd., to Allied Corp., Keith Bldg., Cleveland, **$66,875.** Est. $76,400. J. D. McWilliams, Court House, Cleveland, engr. Bids 6/9.

O., Youngstown—Comrs. Mahoning Co., repaving Lake Park Rd., Smith Twp., incl. resurfacing from Mahoning-Stark Co. line to Heacock Rd., to Ohio Road Imprvt. Co., 30 E. Broad St., Columbus, **$24,498.** Est. $25,000. S. Gould, Youngstown, engr.

Oregon—State Hy. Comn., Salem, imprv. 8.8 mi. Halsey-Harrisburg Sect. Pacific Hy. East, Linn Co., to P. W. Yett, 6500 NE Ainsworth St., Portland, **$376,678*****4.86 mi. street in Sheridan, Yamhill Co., to Western Rock Co., Salem, **$26,574*****removing and disposal approx. 37,000 yd. rock detritus, encroachment on Oneonta Sect. Columbia River Hy., Multnomah Co., to Babler & Conley, 4617 SE Milwaukie (cq) St., Portland, **$25,900.** Grand total $429,152. Bids 6/14. CD 6/6.

★**Tennessee**—State Hy. Dpt., Nashville, imprv. 2.14 mi. non-system hy. from Solway Bridge to Grand Caverns, Knox Co., to Oman Constr. Co., Acklen Park, Nashville, **$143,851;** 7.407 mi. State Route 9 from Knoxville City limits to Anderson Co. line, Knox Co., to Foster & Creighton Co., American National Bank Bldg., Nashville, **$600,978.** Bids 6/16. CD 6/21, under LB.

†**Utah, Ogden**—U. S. Eng., 580 S. State St., Salt Lake City, roads and parking areas, Ogden Air Depot, to Reynolds Constr. Co., Springville, **$40,946.** Bids 6/19.

Wis., Port Washington—Imprv. Spring, Milwaukee, Wisconsin, Main and Franklin Sts., to White Consolidated Inc., 2543 W. Greves St., Milwaukee, Zone 3, **$44,861.** Bids 6/9. CD 5/31.

Ont., Arnprior — Municipality, W. J. Thompson, clk., road reconstruction, to Dibble Constr. Co., Ltd., 249 Albert St., Ottawa. **Est. $25,000.**

Ont., Malton—Victory Aircraft Ltd., ton, paving at plant, to Godson Contg. Ltd., 203 Richmond St. W., Toronto, $63

Ont., Napanee—Municipality M. P. ham, clk., reconstructing pavements, labor. **$25,000.**

★**Quebec**—Dpt. Roads, Quebec City, ea work, graveling 5.7 mi. Hy 11, betw Cascades and Wakefield, to Raymond, Donell & Co., Ltd., 2020 Union Ave., treal, **$130,000*****surface treating in Bea Frontenac, Compton, Wolf, Richmond, biniere, Arthabaska, Drummond, Nic Brome and Shefford districts and coun to L. Boucher, St. Georges de Beauce, $47 and to Abias Pepin, Ltd., 245 St. Tho Ave., Longueuile, **$62,000** *** Muskino Berthier, Joliette, L'Assompton, Montca Terrebonne, Two Mountains, Berthier, genteuil, Papineau, Hull, Gatineau Pontiac, districts and counties, to de la Sud Ltd., 1822 des Carriers St., Montr **$65,000** *** graveling, bituminous conc paving Hy. 23, between St. Henri and So to Page Equipment & Constr. Co. L 1497 Craig St., Three Rivers, **$220,000.** Gr total $524,000. D. Gohfer, Dpt. Ro Quebec City, engr.

Que., Montreal—Municipality, J. A. M geau, clk., paving 9 Ave., 1st section, Charles Duranceau Ltd., 5847 Hamilton **$43,050,** 2nd section, to Alexander Durance 4389 Oxford Ave., **$61,970;** Maplewood, bella and Waverly Aves., to Adelard B vort, 6006 8 Ave., **$28,064.** Grand total $1 084. J. Brosseau, City Hall, engr.

Que., Mount Royal (Postal Dist. M treal)—City, E. Ravel, clk., city, 1020 La Ave., grading Carlyle and Kinderley Av day labor, **$11,000.** W. J. McNeil, 1020 La Ave., engr.

EARTHWORK, WATERWAYS

PROPOSED WORK

O., Cleveland—City, City Hall, bulkhe and jetties between Euclid Creek and N Rd. N.E. $80,000.

BIDS ASKED

Bids Asked June 28

†**N. J., Point Pleasant**—Yards & Doc Navy Dpt., 18 St. and Constitution A N.W., Wash. 25, D. C., sheet steel bulkhead on Manasquan Inlet, for Coa Guard.

Bids Asked July 3

†**Md., Bainbridge (sta. Port Deposit)**— Yards & Docks, Navy Dpt., 18 St. a Constitution Ave. N.W., Wash., 25, D. river intake at Naval Training Statio NOY 9212. CD 4/26—ENR 5/4.

Bids Asked July 6

Mont., Jordan—Montana Water Conserva tion Bd., Helena, concrete spillway on B Dry Creek. $50,000. F. Buck, Helena, c engr. CD 6/1—ENR 6/8.

Illinois—Div. Waterways, 201 W. Monr St., Springfield, chennal imprvs., togethe with necessary appurtenances of Big Cree Union Co. T. B. Casey, acting ch. engr.

Bids Asked July 7

★†**La., New Orleans**—U. S. Eng., foot Prytania St., 4,490,000 to 6,345,000 cu. y earthwork on Lower Tensas Levees of Mi sissippi River, Inv. 16-047-44-134. $2,500,00

Bids Asked July 22

†**New Mexico**—Bureau Reclamation, H. W Bashore, comr., Tucumcari, earthwork an structures Conchas Canal, Station 1342 plu 70 to Station 1603 plus 75, Station 1684 plu 68 to Station 2458 plus 03.15, Station 297 plus 45 to Station 2976 plus 45 and Statio 3041 plus 05 to Station 3048 plus 96 Tucumcari proj., 1 to 21 mi. from Tucumcari, Spec 1076.

Bids Asked July 28

†**Calif., Tulelake** — Bureau Reclamatio Klamath, Ore., Pump. Plants A, B & C Modoc Unit, Tulelake Div., Klamath Proj. Spec. 1075; adv. ENR 6/29.

Bids Asked

†**Maryland**—Yards & Docks, Navy Dpt., 1 St. and Constitution Ave. N.W., Wash. 2 D. C., bulkhead and dredging Naval A Stations, Solomons and Patuxent River, NOY 9115. Bids 6/16, postponed. CD 5/31 under Solomons and Patuxent River.

LOW BIDDERS

Calif., Los Angeles—City, Bd. P. Wks. City Hall, June 14, grading, erosion protection work for water channel near Dorchester and other streets, from Mittry Bros. 4801 San Fernando Rd., **$29,660.** L. Aldrich City Hall, engr.

†**La., New Orleans**—U. S. Eng., foot Prytania St., June 19, dredging approx. 400,-000 cu.yd. from New Orleans Harbor, Inv. 16-047-44-133, from McWilliams Dredging Co., Hibernia Bldg., **7.39c.** per cu.yd.

†**La., New Orleans**—U. S. Eng., foot Prytania St., June 20, approx. 900,000 or 1,200,00

RTHWORK, WATERWAYS (Low Bidders, Cont'd.)

yd. earthwork, etc., Item R 374.1 rgent Levee on Mississippi River levees, er Tensas Levees, Solic. No. 16-047-44-, New Orleans Dist., from Edward E. rgan Co., Inc., Jackson, Miss., **34.67c** per yd. on basic plan and **34.42c** per cu. yd. alternate plan. CD 6/13.

d., Brookmont—Dpt. Interior, National k Service, Interior Bldg., 18 and C Sts W., Wash. 25, D. C., June 20, repairing ne Dam across Potomac River, from J. L. lvaine & F. Burgess, 2409 Good Hope Rd. Wash., D. C., **$16,900.**

Y., New York—Comr. Marine & Aviation, Pier A, North River, Zone 4, June 20, ntr. 2413, slip adjoining northerly side r 75, North River, from O'Brien Bros., 233 B'way., New York, Zone 7, **$17,655.** 6/12—ENR 6/15.

ex., Houston—Harris Co. and Harris Co. D. 2, Houston, June 12, approx. 80,000 yd. excav., from V. R. Allsup, 236 Brace **$46,869.** CD 6/5.

NTRACTS AWARDED

†Calif., Morro Bay—U. S. Eng., 751 S. Figueroa St., Los Angeles, Zone 14, edging in Morro Bay, Inv. 44-11, to Case nstr. Co. & T. E. Connolly Co., Berth 109, n Pedro, Schedule A, **$480,000.** Awarded 23. CD 6/9, under LB.

†Calif., Treasure Island—Yards & Docks, vy Dpt., 18 St. and Constitution Ave. W., Wash., 25, D. C., restoring seawall, placing approx. 12,000 cu.yd. riprap, Secn Base, NOY 9196, to Piombo Bros. & , 1571 Turk St., San Francisco. CD 5/5.

†Kentucky and Tennessee—U. S. Eng., P. O. Box 97, Memphis, Zone 1, Tenn., prox. 698,000 cu. yd. earthwork in Reelt Levee Dist., Hickman, Ky., Solic. No. 041-44-51, to O'Dell & Riney Constr. Co., rkwood, Mo., **$242,904**; approx. 887,000 cu. earthwork in Reelfoot Levee Dist., ench Point, Tenn., Solic. No. 40-41-44-51, C. J. List Constr. Co., Railway Exchange dg., Kansas City, Mo., **$263,439.** Bids 6/15. 6/7——ENR 6/8.

La., New Orleans—Orleans Levee Dist., Civil Courts Bldg., 5 mi. levee work hydraulic method, in Higgins Aircraft ne, to Jahncke Service Inc., 814 Howard e., Houston, Tex., approx. **$410,000.** Est. 0,000. Bids 6/13.

†Ore., Goshen—U. S. Eng., 628 Pittock k, S.W. 10 Ave. and Washington St., rtland, reconstructing levee on Willamette ver, to O. Butler, 4900 N.E. 42 St., Portnd, **$37,000.**

†Tex., High Island—U. S. Eng., 25 St. and venue F, Galveston, dredging 9,000 lin. ft. ouble Bay Channel for approx. 132,000 yd., W 41-243-44-445, to Gulf Coast redging Co., Box 1112, Texas City, **12.3** yd. CD 5/23—ENR 5/25.

UNCLASSIFIED

ROPOSED WORK

Conn., Stratford—PARK—Town, W. Shea, gr., Town Hall, preliminary plans park, cl. baseball, football, tennis, recreation dgs., field house, ¼ mi. track, King St. ect. Over $25,000. H. W. Johnson, 397 lenridge Rd., archt.

Conn., West Hartford—SWIMMING POOL, c.—Town, Town Manager, Town Hall, wimming pool, bathhouses, etc., off Fern . Over $25,000.

†Louisiana—CLEARING AIRFIELDS—U. Eng., 25 St. and Avenue F, Galveston, ex., clearing 187 acres land at 2 airfields, loisant and Callender airports, Sol. 41-243-4-C199 and Sol. No. 41-243-44-C207, at elle Chasse. Over $25,000.

O., Jewett—TUNNEL LINING—Wheeling Lake Erie Railway Co., L. T. Peoples aint. engr., Brewster, rein.-con. tunnel ling replacing present deterioration timber nnel lining. $75,690.

†Okla., Oklahoma City — AIRFIELD BLDG. SOUND ABSORBING BAFFLES—. S. Eng., 416 Wright Bldg., Tulsa, Zone , sound absorbing baffles in engine test ldg., Tinker Airfield. Over $50,000.

†Tex., San Antonio—AIRPORT BLDG.—ity, G. Mauermann, mayor, City Hall, lans 90% completed by A. B. & R. M. yres, Transit Tower Bldg., 4 story, glass, oncrete, CAA steel municipal airport administration bldg. $425,000. CD 2/17—NR 2/24.

Utah—TRACK—Denver & Rio Grande Western R.R. Co., A. E. Perlman, ch. engr., io Grande Bldg., Denver, 400 ft. passing rack at American Fork, Midvale and Riverton. $175,841.

†Md., Patuxent River (br. Wash., D. C.)—AIR STATION BLDG.—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., ships service store ddn., Naval Air Station, NOY 9215. CD /2—ENR 6/8.

★ **N. Y., Idlewild**—AIRPORT DREDGING Dpt. Marine & Aviation Pier A, North River, New York, Zone 4, dredging 8,500,000 u.yd. at airport, $2,000,000. J. Downer, 0 Rockefeller Plaze, New York, Zone 20, ngr. CD 6/23.

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UNCLASSIFIED (Bids Asked, Cont'd.)

Bids Asked July 5

Sask., Regina—RUNWAY PAVING—Secy. Dpt. Transport, Ottawa, Ont., hard surface runway reconstruction and constructing hard surface on present gravel base areas at airport. $55,000. Plans deposit $10.

Bids Asked July 6

★**†O., Springfield**—AIRPORT, etc.—Civil Aeronautics Admin., 608 S. Dearborn St., Chicago, Ill., airport imprvs. $800,000. Plans deposit $25. CD 4/24—ENR 4/27.

Man., Winnipeg—RUNWAYS—Secretary Dpt. Transport, Ottawa, Ont., reconstructing, resurfacing hardsurface runways, at airport, $75,000.

Saskatchewan—RUNWAY SURFACING—Secy. Dpt. Munitions & Supply, Ottawa, Ont., hardsurfacing runway and on present gravel base area at R. C. A. F. station, for Dpt. National Defense (Air), Ottawa, Ont. $60,000.

Bids Asked July 7

†Md., Patuxent River (br. Wash., D. C.)—PARKING AREA—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., addnl. parking area, Naval Air Station, NOY 9850.

Bids Asked July 8

†Va., Dahlgren—PIER—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., pier, Naval Proving Ground, NOY 9651.

Bids Asked About July 10

Iowa—RURAL ELECTRIC LINES—Sac County Rural Electric Co-operative, Sac City, rural electric transmission lines, Sac Co. $45,000. Brown Engineering Co., 203-8 Valley Bk. Bldg., Des Moines, engrs. CD 3/21—ENR 3/23.

Bids Asked July 13

Nebraska—TRANSMISSION LINES—Cuming Co. Rural Pub. Power Dist., Westpoint, 52.2 mi. transmission lines, Cuming Co., Henningson Eng. Co., Standard Oil Bldg., Omaha, engr.

New Jersey—TUNNEL BLDG.—At office Executive Director. The Port of New York Auth., F. C. Ferguson, chn. 111 Eighth Ave., New York, N. Y., Plaza Office Bldg. addn., Contr. HT-1, New Jersey Entrance Plaza, Holland Tunnel. Plans deposit $5; adv. ENR 6/29.

Bids Asked After July 17

Iowa—RURAL ELECTRIC LINES—Harrison County Rural Electric Co-operative, Woodbine, rural electric transmission lines, Harrison Co., $65,000. Brown Engineering Co., 203-8 Valley Bank Bldg., Des Moines, engrs. CD 3/21—ENR 3/23.

Iowa—RURAL ELECTRIC LINES—Lyon Rural Electric Co-operative, Rock Rapids, rural electric transmission lines, Lyon Co. $50,000. Brown Engineering Co., 203-8 Valley Bk. Bldg., Des Moines, engrs. CD 3/21—ENR 3/23.

Bids Asked July 26

†Ark., Camp Joseph T. Robinson—MACHINE GUN RANGE—U. S. Eng., 300 Bway., Little Rock, machine gun range, No. 98.

Bids Asked

†Md., Patuxent River (br. Wash., D. C.)—AIR STATION BLDG.—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., workshop and transfer station, Naval Air Station, NOY 9119. Bids 7/6 postponed. CD 5/11.

†Mass., New Bedford—LOADING PLATFORM, etc.—U. S. Eng., 31 St. James Ave., Boston (selected list bidders), loading platform, some track work, No. 19-023-44-Neg-221. $15,000.

†Mass., Orange—AIRFIELD GRADING, etc.—U. S. Eng., 819 Industrial Trust Bldg., Providence, R. I., (selected list bidders), grading, seeding, fertilizing airfield, No 44/98.

★**Okla., Cleveland**—COMPRESSOR UNITS—Cities Service Gas Co., Bartlesville, and Cities Service Transportation & Chemical Co., Ponca City, addnl. compressor units for pipeline, etc. $500,000. CD 3/2—ENR 3/9.

LOW BIDDERS

†Ariz., Bouse—DEMOLITION CAMP FACILITIES, etc.—U. S. Eng., 751 S. Figueroa St., Los Angeles, 14, Calif., demolition camp facilities and restoration of site at Camp Bouse, Inv. 651, from Lynch Constr. Co., 730 E. Gage Ave., Los Angeles, Calif., **$49,750.**

La., New Orleans—HANGARS, etc.—New Orleans Aviation Bd., City Hall, June 14, hangar and administration bldgs., from E. B. Ludwig Const. Co., Cypress St., Items (1) **$25,750**, (2) **$40.850** and (3) **$66.600.** Est. over $40,000. CD 6/8—ENR 4/20.

Oregon—POWER LINE—Benton-Lincoln Electric Coop., 1555 Monroe St., Corvallis. June 10, 65½ mi. single phase, 2-wire primary power line, Ore. 2004 C-1, Lincoln unit 1 and 2, Linn Co., from C-L Electric Co., Pocatello, Idaho, **$66,844.** CD 5/19—ENR 5/25.

CONTRACTS AWARDED

★**†Calif., Alameda** — AIR STATI BLDGS.—Yards & Docks, Navy Dpt., St. and Constitution Ave. N.W. Wash., D. C., addnl. personnel bldgs. Naval Station, NOY 9948, to Louis Dunn Monadnock Bldg., San Francisco, **$620,** Bids 6/9.

★**†Calif., Hamilton Field** — APR STRENGTHENING—U. S. Eng., 74 N Montgomery St., San Francisco, Zone strengthening existing apron, Job 1401, Chas. L. Harney, 625 Market St., San Fr cisco, **$689,826.** CD 5/31, under LB.

†Fla., Jacksonville—SWIMMING POOL Yards & Docks, Navy Dpt., 18 St. and Co stitution Ave. N.W., Wash., 25, D. C., structional swimming pool, N A T T C, N 8755, to Paul A. Miller Constr. Co., Le burg, **$244,532.** CD 3/30—ENR 4/6.

†Fla., Pensacola—AIR STATION BLD —Yards & Docks, Navy Dpt., 18 St. a Constitution Ave. N.W., Wash., 25, D. auxiliary power plants, Naval Air Statio NOY 8709, to Burford, Hall & Smith, Edgewood Ave. N.E., Atlanta, 3, Ga., **$13 095.**

★**†Ia., Dubuque**—AIRPORT—Civil Aer nautics Admin., 410 E. 12 St., Kans City, Mo., airport, to McVaugh-Haynes C Peoria, Ill., **$1,581,806.** Bids 3/6. CD 3/10 ENR 3/16, under LB.

†Md., Patuxent River (br. Wash. D. C.) RAILROAD WORK—Yards & Docks, Na Dpt., 18 St. and Constitution Ave. N.W Wash., 25, D. C., railroad work, Naval A Station, NOY 9220, to Consolidated Eng neering Co., 20 E. Franklin St., Baltimor Md., **$112,300.** Bids 6/23. CD 6/14—EN 6/8.

†Mass., Westover Field (sta. Chicop Falls)—APRON—U. S. Eng., 31 St. Jam Ave., Boston, concrete service apron, N 19-023-44-NEG 215, to Arute Bros., Inc., S. Main St., New Britain, Conn., **$247,7** Bids 6/19. CD 6/15, under Chicopee.

†Mich., Oscoda—AIRFIELD PAVING, et —U. S. Eng., 500 Griswold St., Detroit, pa ing, training aids, etc., AAF, Contr. 20-06 Eng-1179, to Bridgeport Core Sand Co., 1 Davenport St., Saginaw, **$29,309.**

★**†Mo., Springfield**—AIRPORT—Civil Aer nautics Admin., 410 E. 12 St., Kan City, Mo., airport, Proposal No. 5P-4- Schedules 1 and 2, to Gustafson & Jar Constr. Co., Sioux Falls, S. D., **$766,5** Schedule 4, to Koss Constr. Co., Old Colon Bldg., Des Moines, Ia., **$666,474.** Bids 3/2 CD 3/23—ENR 3/30, under LB.

†N. J., Newark—AIRPORT PAVEMEN —U. S. Eng., 120 Wall St., New York, N. Y., miscellaneous pavement constructio Newark Airport, Contr. 30-075-Eng-1439, t Standard Bitulithic Co., 50 Church St., Ne York, N. Y. Est. **$89,023.**

†N. M., Clovis—AIRFIELD BLDGS.—U. S Eng., Albuquerque, addnl. trainer bldgs, AAF, Contr. 29-005-Eng-236, to A. J. Rif Constr. Co., 2808 Inwood Rd., Dallas, Te Est. **$28,423.**

†N. Y., Miller Field (sta. Staten Island)- AIRFIELD BLDGS.—U. S. Eng., 120 Wal St., New York, Zone 5, altering bldg Contr. 30-075-Eng-1436, to Maran Cons Co., Inc., 1910 Arthur Ave., New York. Es **$65,070.**

†N. Y., Brooklyn — FIRE PROTECTION- Yards & Docks, Navy Dpt., 18 St. and Con stitution Ave. N.W., Wash., 25, D. C., fire pro tection Naval Magazine, Ft. Lafayette, NO 8450, to H. G. Vogel Co., Inc., 1819 Bway., Ne York, **$72,013.** CD 5/11.

†O., Columbus—HANGAR, etc.—Yards Docks, Navy Dpt., 18 St. and Constitutio Ave. N.W., Wash., 25, D. C., hangar an leanto, barracks, recreation bldg., parkin area, NA F, Pt. Columbus, NOY 8897, t James I. Barnes Constr. Co., Talbot Realt Bldg., Dayton, **$380,000.** Bids 6/5. CD 5/31

Oklahoma—GAS PIPELINE—Cities Serv ice Gas Co., Bartlesville, and Cities Service Transportation & Chemical Co., Ponca City, laying 35 mi. 16 in. steel natural gas mai in loop from Blackwell Station to Osag Co., to Oil States Constr. Co., Oil Petroleum Bldg., Tulsa, Okla., and Blackwell, **$225,00** Est. $275,000. CD 3/2—ENR 3/9.

†Okla., Oklahoma City — AIRFIEL BLDGS.—U. S. Eng., 416 Wright Bldg., Tulsa, Zone 2, engine repair bldg. addn. alterations, Tinker Field depot, near here to W. R. Grimshaw Const. Co., Philtower Bldg., Tulsa, **$179,055.** Bids about 6/1 awarded 6/19. CD 6/5—ENR 6/8.

★**Pennsylvania and West Virginia**—NATURAL GAS PIPELINE—Peoples Natural Gas Co., 525 Wm. Penn Way, Pittsburgh, Pa., and Hope Natural Gas Co., Clarksburg, W. Va., 145 mi. natural gas pipeline between Greene Co., Pa., and Wetzel Co., W. Va., to Monongahela & Ohio Dredging Co., Oliver Bldg., Pittsburgh, Pa.; Pennsylvania Sect., to B & M Constr. Co., Petroleum Bldg., Oklahoma City, Okla.; West Virginia Sect., to Pipe Line Constr. Co., Gettysburg Rd., Camp Hill, Harrisburg, Pa. Est. **$2,700,000.** CD 5/8—ENR 5/11.

UNCLASSIFIED (Contracts Awarded, Cont'd.)

†Pa., Phila.—FIRE PROTECTION, etc.—U. S. Eng., Penn Mutual Bldg., 6 and Walnut Sts. fire protection and water supply, Hog Island, Contr 36-109-Eng-578, to Automatic Sprinkler Co of America, 1133 Broad St., **$344,282.**

†Tennessee and Arkansas — CONCRETE MATTRESS CAST—U. S. Eng., West Memphis, Ark., approx. 25,000 squares articulated concrete mattress cast at Richardson Landing, Tenn. Casting Field, also 25,000 squares at Helena, Akr. Casting Field, to Weymouth Constr. Co., 2174 Pearson St., Memphis, Tenn., **$399,750.**

Tex., Higgins—GAS PIPELINE—Panhandle Eastern Pipe Line Co., Philtower Bldg., Tulsa, Okla., 32 mi. 22 in. natural gas pipeline in Texas-Oklahoma Panhandle areas, to Midwestern Engrg. Co., Petroleum Bldg., Tulsa, Okla., approx. **$246,000.** CD 5/31—ENR 6/8.

†Tex., Randolph Field—RUNWAYS, etc.—U. S. Eng., Fort Sam Houston, repairing runways, taxiways, apron at Clear Springs Auxiliary Field, Spec. 1131, to Collins-Bland Constr. Co., P. O. Box 1158, Austin, **$29,172.**

†Tex., Texarkana—STORAGE PADS, etc.—U. S. Eng., 231 W. Main St., Denison, storage pads, road imprvs., etc., Contr. 41-242-Eng-244, to McKinney Constr. Co., Marshall, **$40,314.**

†Utah, Ogden—SPRINKLER SYSTEM—U. S. Eng., 1209 8 St., Sacramento, 8, Calif., sprinkler sys. at Ogden Arsenal, to Grinnell Co. of the Pacific, 5 and Brannan Sts., San Francisco, Calif., **$66,699.** Bids 5/23.

†Wash., Seattle—AIR STATION BLDGS.—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., chapel and collateral, Naval Hospital, Naval Air Station, NOY 9408, to J. W. Bailey Constr. Co., 228 9 Ave. N., **$198,000.** Bids 6/5. CD 4/21—ENR 4/27.

Wisconsin — ELECTRIC DISTRIBUTION SYSTEM—Oconto Electric Co-op., C. Koslowsky, secy., Oconto Falls, 40 mi. electric distr. sys., Proj. Wisc. 4014D2-Oconto, to Harris-McBurney Co., Jackson, Mich., **$45,294.** Bids 6/14. CD 12/10—ENR 12/16.

†Wyo., Casper—AIR BASE BLDGS.—U. S. Eng., 909 17 St., Denver, Colo., 2 celestial navigation trainer bldgs., Army Air Base, to Rognstad-Olsen Constr. Co., Casper, **$28,500.** CD 6/9—ENR 6/8.

N. W. T., Port Simpson—WHARF—Dpt. P. Wks., Ottawa, Ont., repairing wharf, to Armour Salvage & Towing Co., Ltd., Granville Island, Vancouver, B. C., **$30,562.**

PUBLIC BUILDINGS

PROPOSED WORK

†Calif., Fallbrook—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., engineering and architectural services by Kistner, Curtis & Wright, 715 Architects Bldg., Los Angeles, addnl. magazine, Naval Ammunition Depot.

Ga., Columbus—City Hospital, c/o S. Albrecht, mayor, City Hall, imprv. city hospital, incl. X-Ray Laboratory, kitchen, dining room and laundry.

†Ill., Joliet—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., engineer-architect services by Burnham & Hammond, Inc., 160 N. La Salle St., Chicago, construction and repair work at central spare parts warehouse.

La., New Orleans—City, plans by Wm. R. Burk Associated Architects & Engineers, Pan American Bldg., 200 bed tuberculosis hospital on 125x125 ft. site, N. Rampart and St. Louis Sts.

La., New Orleans—New Orleans Hospital Dispensary, Jackson Ave., plans by William R. Burk Associated Architects & Engineers, Pan American Bldg., 3 story, 90x160 ft., hospital bldg., Jackson Ave.

†La., Baton Rouge—Our Lady of the Lake Sanitarium, c/o Sister H. Didisse, Across Dyke, plans by Bodman & Murrell, 713 Raymond Bldg., nurses' training school, La. 16-256-N. $110,000-$150,000. **FWA.** CD 4/20—ENR 4/27.

★**†La., Shreveport**—J. B. Beaird Corp., 6200 St. Vincent St., constructing, equipping, shell machining and forging plant for steel plant. $1,000,000 authorized. Defense Plant Corp. will finance.

Me., Lewistown—City, Mayor's Office, City Hall, bldg., incl. storage facilities, administration offices and incinerator, for P. Wks. Dpt. $220,000.

†Me., Bangor—Pub. Housing Auth., NHA, 24 School St., Boston, Mass., grading for housing, Me. 17011. Prentiss & Carlisle, 12 Hammond St., archts.

†Md., Baltimore—U. S. Eng., Standard Oil Bldg., making plans converting shed into warehouse, addns. $80,000.

†Mo., Kansas City—St. Luke's Hospital, 44 and Mill Creek Sts., plans by Keene & Simpson, Land Bank Bldg., Kansas City, Mo., nurses' home, Mo. 23-286-N. $400,000. **FWA.** CD 9/30—ENR 10/7.

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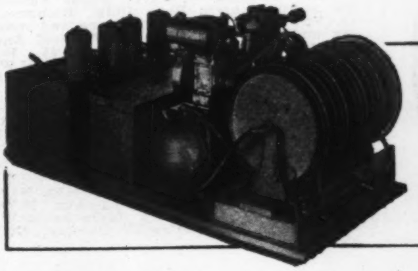

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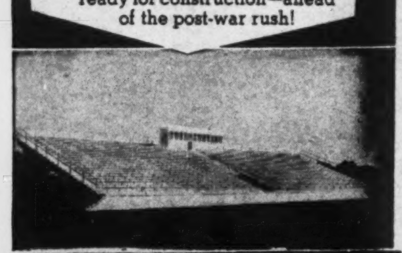

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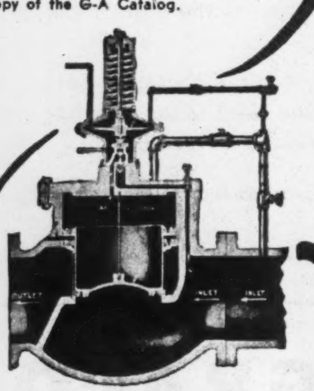

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PUBLIC BLDGS. (Proposed Work, Cont'd.)

Mo., Rock Hill—Rock Hill School Dist., T. D. Adams, supt., 9420 Manchester Rd., St. Louis, Zone 22, voted $125,000 bonds, brick school, Warson Rd. and O'Day Ave. $125,000-$150,000.

†Mo., St. Louis—Lutheran Hospital, Rev. E. C. Hofius, supt., 2646 Potomac St., St. Louis, Zone 18, bids soon 3 story, brick, concrete nurse's home addn., 2630 Potomac St., Mo. 23-295N. $93,000. **FWA.** Wm. B. Ittner, Inc. 408 Bd. Educ. Bldg., 911 Locust St., Zone 1, archts.-engrs. CD 6/12—ENR 6/15.

†N. H., Portsmouth—Pub. Housing Auth., NHA, 4 School St., Boston, Mass., making plans sewage rack unit bldg., for housing NH 27013. Whitman & Howard, Inc., 89 Broad St., Boston, Mass., engrs.

†N. Y., Pawling—U. S. Eng., 120 Wall St., New York, Zone 5, bids soon, converting school into Army Air Forces Convalescent Center. $100,000.

†O., Dayton—Pub. Housing Auth., NHA, 2073 E. 9 St., Cleveland, plans by Dayton Housing Architects, 423 Natl. Bank Bldg., 50 room dormitory, housing, Ohio 33295.

★**†Pa. Punxsutawney**—Speer Carbon Co., A. S. Bemis, supt., St. Marys, completed plans mfg. plant addn. $900,000. Defense Plant Corp. will finance.

†S. C., Beaufort—Federal Works Agency, 18 and F Sts. N.W., Wash., 25, D. C., bids soon recreational bldg. addns., SC 38-242-F, Lafay, Lafay & Fair, 1226 Sumter St., Columbia, archts. CD 5/22—ENR 5/25.

Tenn., Knoxville—City, c/o A. Atkin, Welfare Dir., addn. General Hospital. $170,000. Applied to FWA.

†Tex., Harlingen—U. S. Eng., 25 St. and Avenue F, Galveston, warehouses, docks, etc. Over $100,000.

Tex., Orange—J. W. Edgar, supt. Schools, Orange, plans by Hedrick & Lindsley, 818 So. Standard Bldg., Houston, Zone 2, school facilities. $210,045. Applying for FWA funds.

†Tex., Spearman—Pub. Housing Auth., NHA, 1205 Electric Bldg., Seventh and Taylor Sts., Fort Worth, Zone 2, 100 family dwelling stop-gap housing units, Tex. 41-656.

†Tex., Temple—U. S. Eng., Fort Sam Houston, 1 story, 32x100 ft., brick, tile central service bldg., and removing, relocating existing fire escape ramp, McClosky General Hospital, Spec. 1133.

†Va., Oakton—Bd. Educ., Court House, Fairfax, revising plans and new bids soon school. **FWA.** Bids 6/14 rejected.

†Wash., Port Orchard — Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash., 25, D. C., 2 school bldgs., Wash. 45-283.

B. C., Chilliwack—Chilliwack High School Area Bd., Chilliwack, voting July 5 on money by law for 2 story, 75x200 ft., frame, stucco school, and 1 story, 80x160 ft., frame, stucco bldg. to be used as workshop structure. $196,000. Twizell & Twizell, Metropolitan Bldg., Vancouver, archts.

B. C., Vancouver — Vancouver General Hospital, 453 W. 12 Ave., renewing heating and refrigerating plant. $200,000. City proposes to submit $200,000 bylaw to ratepayers, Dec. 13. CD 6/20—ENR 6/22.

★**Que., Gaspe**—Province of Quebec, c/o Dpt. Health, Quebec City, plans by Dpt. P. Wks., Quebec City, 200 bed sanitorium. $700,000.

Que., Montreal West—Secy. Dpt. P. Wks., Ottawa, Ont., plans by C. David, 1440 St. Catherine St. W., army hospital.

BIDS ASKED

Bids Asked June 26

†Va., Norfolk—Pub. Housing Auth., NHA. Temporary Bldg. 2, 19 and D Sts. N.W., Wash., 25, D. C., activity bldg., Va. 44074. Norfolk Assoc. of Architects, 932 Royster Bldg., archts.

Bids Asked In July

†Me., Brunswick—Town, A. E. Morrell, chn. Comn., superstructure, recreation bldg., Me. 17-166. $80,000. **FWA.** A. J. Harriman, 88 Shepley St., Auburn, archt.

Bids Asked July 2

†Md., Baltimore—Federal Works Agency, 601 State Planters Bank Bldg., Richmond, 19, Va., school addn., alterations and moving and rebuilding 1 school, Fairfield Sec., Md. 18-197. **FWA.** Plans deposit $5. Bid date change. H. Robinson, 1927 11 St. N.W., Wash., D. C., archt. CD 6/21—ENR 11/25.

Bids Asked July 3

†D. C., Wash.—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Zone 25, air conditioning for aviation ordnance design bldg., gage laboratory 2 test rooms in Bldg. 197, Naval Gun Factory.

†Md., Indian Head—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., Waves barracks addn., Quarters D, Naval Powder Factory, NOY 9864.

Bids Asked July 5

†Conn., Fairfield—Pub. Housing Auth., NHA, 24 School St., Boston, Mass., grading, laying water pipe, housing, Conn. 6071 and 6072. Plans deposit $50 for first set and $10 for ea. addnl. set. Whitman & Howard, 89 Broad St., Boston, Mass., engrs. CD 6/21

Bids Asked July 6

†Del., Bellevue—School Bldg. Comn. of Mt. Pleasant, Dist. 2, 1 story, school addn., Del. 7-111. **FWA.** Martin & Jeffers, 401 W. 24 St., Wilmington, archts. CD 5/18—ENR 5/25.

Bids Asked July 6

Minn., New Ulm—City Pub. Utilities Comn., A. C. Sannwald, secy., furnishing, installing 6,000 kw. steam turbine generator and surface condenser with auxiliary equip. in power plant, bldg. alterations, $100,000 (not official). Plans deposit $35. R. D. Thomas & Associates, 1200 2 Ave. S., engrs.

Bids Asked July 7

†O., Euclid (br. Cleveland)—Euclid Bd. Educ., Mrs. Alice M. Dressler, clk., 1520 Chardon Rd., 2 story, bsmnt., 60x150 ft., brick, steel, concrete Upson School addn., Ohio 33-292-N. $149,000. **FWA.** Plans deposit $20. H. A. Fulton, 6014 Euclid Ave., Cleveland, archt. CD 6/8—ENR 6/15.

Bids Asked About July 10

†Calif., Vallejo—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash., 25, D. C., 7 classroom addn. to Flosden School, Calif. 4-454-2A. H. J. Devine, Cronan Bldg., Sacramento, Zone 14, archt. CD 6/16—ENR 6/22

Bids Asked July 10

†Md., Indian Head—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., housing for Waves, Naval Powder Factory, NOY 9192. CD 6/7—ENR 5/4.

Minn., Sleepy Eye—City, J. S. Jensen, clk. City Hall, furnishing, installing boiler and turbine in municipal power plant, bldg. alterations. $200,000. R. D. Thomas & Associtates, 1200 2nd Ave. S., Minneapolis, engrs. CD 4/10—ENR 4/18.

Bids Asked After July 10

†Pa., Farrell—Pub. Housing Auth., NHA 270 Bway., New York, 7, N. Y., 150 unit family dwellings, Pa. 20-1. Extended date. Burke, Smart & Braziell, Magee Bldg., Pittsburgh, archts. CD 5/11—ENR 5/18.

Bids Asked July 11

†Calif., Vallejo—Federal Works Agency 15 Shattuck Sq., Berkeley, Zone 1, 2 nursery school bldgs., 1 on Caroline St. and other on Star Ave., adjoining Curry School, Calif. 4-559-F. Plans deposit $15. H. J. Devine Cronan Bldg., Sacramento, archt.

Bids Asked July 12

†N. C., Elizabeth City—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash., 25. D. C., health center, NC 31-279. **FWA.** A. M. Lublin, 514 Dickson Bldg., Norfolk Va., archt. CD 1/13—ENR 1/20.

Bids Asked August 1

†Ill., Downey—Veterans Admin., Vermont Ave. between H and I Sts. N.W., Wash., 25, D. C., Boiler House Bldg. 33 addn. Proj. 2261.

Bids Asked About July 13

†Fla., Panama City—Pub. Bldgs. Admin. 18 and F Sts. N.W., Wash., 25, D. C., 1 story, health center Fla. 8-303. **FWA.** Smith & Gillespie, P. O. Box 1048, Jacksonville archts. CD 4/19—ENR 4/27.

†Ore., Vanport City (br. Portland)—Pub. Bldgs. Admin., 18 and F Sts., N.W., Wash. 25, D. C., 1 story, 21 classroom bldg. for School 6, Ore-35-174-1, and 6 classroom addn. School 4, Ore. 35-174-2. **FWA.** Wolff & Phillips, 509 Pearson 4th Ave. Bldg. Portland, Zone 4, archts. CD 4/11—ENR 4/13.

Bids Asked July 14

†Md., Greenbelt—Federal Works Agency 18 and F Sts. N.W., Wash., 25, D. C., elementary school and high school addn., Md. 18-203. $300,000. Extended date. V. Homsey and E. H. Klaber, 1620 Connecticut Ave. N.W., Wash., D. C., archts. CD 6/22—ENR 6/15.

Bids Asked About July 15

†N. J., Somerville—Somerset Hospital, Rehill Ave., 3rd story, brick hospital addn., alterations, N.J. 28-177-N. $300,000. **FWA.** Extended date. Crow, Lewis & Wick, 200 5 Ave., New York, N. Y., archts. CD 5/1—ENR 5/4.

Bids Asked July 18

†Colo., Fort Lyon—Veterans Admin., Vermont Ave. between H and I Sts. N.W., Wash., 25, D. C., 2 tile silos, approx. 20 ft. diam., 40 ft. high. CD 3/21—ENR 3/23.

Bids Asked July 19

★**†Ill., Chicago**—Pub. Housing Auth., NHA, 208 S. La Salle St., 250 unit 2 story, duplex residences, Ill. 11-208. $1,500,000. Plans deposit $100. Extended date. Loebl & Schlossman, 333 N. Michigan Ave., archt. CD 6/7—ENR 6/15.

UBLIC BLDGS. (Bids Asked, Cont'd.)

Bids Asked

†Conn., **Newington**—U. S. Eng., 31 St. mes Ave., Boston, Mass. (selected bidders), nsport and erect 2 bldgs. $7,500.

†Del., **Newark**—U. S. Eng., Penn Mutual ldg., 6 and Walnut Sts. Phila., Pa., altering, ldgs. Ammunition Depot and railroad cilities.

†Mass., **Springfield** — Monsanto Chemical ., 812 Monsanto Ave., 2 story, 62 x 80 ft., in.-con. factory. $40,000 Federally financed. D 6/13—ENR 6/15.

OW BIDDERS

★ †Ala., **Tuskegee**—Veterans Admin., Vermont Ave. between H and I Sts. N.W., ash., 25, D. C., June 20, addnl. bldgs., tilities, etc., from Penker Associates, Inc., 30 Sumner St., Cincinnati, O., **$801,900.** D 5/2—ENR 5/4.

†Calif., **Pasadena**—St. Luke's Hospital, 00 E. Washington St., rein.-con. hospital ddn., Calif. 4-394, from Wm. C. Crowell, 0 E. California St., **$176,000. FWA.** G. erge, 1709 W. 8 St., Los Angeles, archt. CD 2—ENR 2/10.

†Calif., **Port Chicago**—Housing Auth. of ontra Costa Co., 700 D St., Martinez, all te work, incl. utilities and fdn. work in onnection with 200 prefabricated family nits, Calif. 4848, for NHA, from M. J. B. onstr. Co., 322 Elk's Bldg., Stockton, **167,151.** CD 4/19—ENR 4/27.

†D. C., **Anacostia**—Yards & Docks, Navy pt., 18 St. and Constitution Ave. N.W., ash., 25, D. C., June 19, cold storage bldg., avy Training Center, NOY 9244, from V. R. eauchamp, 2601 Connecticut Ave. N.W., ash., **$178,900.** CD 6/6—ENR 6/8.

★ †D. C., **Bellevue**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., ash. 25, D. C., June 23, aircraft electric esearch Bldg., Naval Research Laboratory, OY 8903, from William P. Lipscomb Co., nc., Woodward Bldg., Wash., D. C. **$577,069.** D 6/12—ENR 6/15.

★ †Md., **Indian Head**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., ash. 25, D. C., June 21, chemical laboratory t Naval Powder Factory, NOY 9363, from ames Stewart & Co., Washington Bldg., ash., D. C., **$529,500.** CD 6/12—ENR 5/4.

†Minn., **St. Paul**—C. T. Miller Hospital, Dr. P. D. Ward, supt., 125 W. College Ave., une 14, general contract nurses' home and xpanding cafeteria, from Standard Constr. o., 604 National Bldg., Minneapolis, **$172,-66. FWA.** CD 6/6—ENR 6/8.

†Miss., **Pass Christian**—Merchant Marine raining Station, c/o Commander Andrews, ass Christian, 2 and 3 story, barracks, and dministration bldg., treated wood fdn. pilng, concrete footings and foundation walls, and 2 story, galley bldg., from Oman & reighton, 724 American Natl. Bldg., Nashille, Tenn., **$285,000.**

★ †N. Y., **Long Island City**—U. S. Eng., 120 Wall St., New York, Zone 5, June 19, superstructure post office, from John A. Johnson & Sons, 268 41 St., Brooklyn, **$2,335,916.** CD 6/8—ENR 6/15.

†Tex., **Kelly Field**—U. S. Eng., Fort Sam Houston, June 23, boiler house addn., installing 3 addnl boilers, Spec. 1127, from Hill & Combs, 321 Melrose Pl., San Antonio, **$31,179.** CD 6/15—ENR 6/22.

CONTRACTS AWARDED

†Calif., **Benicia**—U. S. Eng., 74 New Montgomery St., San Francisco, addnl. bldg., etc., Proj. X and I, L.G.Q., and addns. to Project B, Benicia Arsenal, Spec. 1396-4, to J. Strizek, 1916 Bway., Oakland, **$190,752.**

★ †Calif., **Oakland**—U. S. Eng., 74 New Montgomery St., San Francisco, Zone 19, Postal Concentration Center, Oakland Army Base, to Ford J. Twaits Co., 2501 Russ Bldg., San Francisco, **$1,025,000.** CD 6/19—ENR 6/22, under LB.

†Ill., **Chicago**—St. Joseph's Hospital, Inc., Sister Zita, pres., 2100 N. Burling St., brick, rein.-con. nurses' home addn., Ill-11-294, to G. K. Newberg, 9 S. Clinton St., about **$175,000. FWA.** Bids 6/15. CD 6/12—ENR 4/13.

†Md., **Bainbridge (sta. Port Deposit)**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., dry cleaning bldg., Naval Training Station, NOY 8766, to Alexander Co., 3 and Vaughn Sts., Harrisburg, Pa., **$43,402.** Bids 6/19. CD 6/6.

★ †Md., **Baltimore** — Baltimore Housing Auth., 709 E. Eager St., 600 unit housing, Md. 211, Cherry Hill Sect., for NHA, to Ross Engineering Co., 3308-14 St. N.W., Wash., D. C., **$3,350,000.** Est. $3,000,000. Bids 6/6. CD 6/8—ENR 6/15, under LB.

†Minn., **Minneapolis**—G. Arneson, city purch. agt., City Hall, general contract 5 story nurses home addn., General Hospital, for City Bd. Pub. Welfare, 401 City Hall, to Standard Constr. Co., 604 National Bldg. **$253,925. FWA.** Bids 6/15. CD 6/1—ENR 6/8.

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PUBLIC BLDGS. (Contracts Awarded. Con't.)

Minn., Windom—Village, Utilities Dpt., J. Turner, engr., power plant alterations, furnishing, installing 1,000 kw. turbo-generator, condenser, electric work, addn. switch addn., cooling tower, basin for tower, pumps, etc., to Elliott Co., 216 Baker Bldg., Minneapolis, **$100,000.**

†Pa., Fort Mifflin (sta. Phila.)—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., completing smokeless powder magazine, Naval Ammunition Depot, NOY 9664, to Francis A. Canuso & Son, 804-6 S. 12 St., Phila., **$95,000.** Bids 5/20. CD 5/12.

†Pa., Phila.—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., replacing monitor sash in Bldg. 57, Navy Yard, NOY 9729, to Eberle & White, 250 S. Van Pelt St., Zone 3, **$34,514.**

†Va., Quantico—Yards & Docks, Navy Dpt. 18 St. and Constitution Ave. N.W., Wash. 25, D. C., laundry bldg. exten., Marine Barracks, NOY 7481, to Chas. H. Tompkins Co., 907 16 St., Wash., D. C., **$163,700.**

†Wis., Merrimac—U. S. Eng., 408 Federal Bldg., Milwaukee, final press bldg. at Badger Ordnance Plant, to J. P. Cullen & Son, 109 S. Main St., Janesville, **$453,952.** Bids 6/16. **Hercules Powder Co. will operate.**

COMMERCIAL BUILDINGS

PROPOSED WORK

★ **Ore., Salem—Deaconess Hospital, 685 S. Winter St., plans by W. E. Kelly, 808 SE 28 St., Portland, 5 story, brick, hospital, incl. 4 surgeries, and laboratories,** etc. $500,000.

★ **Tenn., Knoxville** — East Tenn. Baptist Hospital, Knoxville, plans by Barber & McMurray, 517½ W. Church Ave., hospital. $1,000,000.

★ **Tenn., Nashville**—Scarrit College, Dr. H. C. Stunts, pres., 1008 19 Ave. S., dormitory and physical education bldg. $988,333.

Tex., Brownsville—Richard Gill Co., Gunter Bldg., San Antonio, plans by F. Green, Glendale, Calif., Rancho Grande Tourist Courts, one hundred 12½x23 ft. housing units, etc., San Benito-Brownsville Hy. $450,000. CD 6/21.

Tex., Dallas—Parkcrest, Inc., Mercantile Bank Bldg., six 2 story bldgs., containing 88 apartments, Fort Worth Ave., Crest St., Anniels and Walter Drs. $245,000.

Tex., Gonzales—B.P.O.E. (Elks Lodge), 820 Crawford St., Houston, plans by J. M. Marriott, 220 Frost Bldg., San Antonio, bldgs., indoor swimming pools, facilities for Crippled Children Institution. $175,000.

Que., Montreal—Authentic Type Homes, Lt., 1106 A Burnside Ave., plans by H. J. Doran, Cote des Neiges Rd., apartment blocks. $220,000. CD 3/16—ENR 3/30.

Que., Montreal—Century Const. Co., Ltd., 574 Roslÿn Ave., Westmount, plans by H. E. Greenspoon, 1434 St. Catherine St. W., apartment house, $150,000.

BIDS ASKED

Bids Asked In October

Mass., South Lancaster—Atlantic Union College, Flagg St., 2 story, 40 x 60 ft., and 50 x 175 ft., brick administration bldg. $150,000. R. Senseman, Carroll Ave., Takoma Park, Wash., D. C., archt. CD 6/7—ENR 6/15.

N. B., Saint John—Famous Players Canadian Corp., Ltd., Royal Bank Bldg., Toronto, Ont., theatre, Kings Sq. Over $150,000. Kaplan & Sprachman, 305 Dundas St. W., Toronto, Ont., archts. E. A. Cross, 991 Bay St., Toronto, Ont., engr.

CONTRACTS AWARDED

Calif., Compton—G. G. Larfield, 2725 Woodhaven Dr., Hollywood, forty-seven 6 room, frame, stucco dwellings at various locations. Owner builds. **$160,000.**

Mass., Cambridge—Massachusetts Institute of Technology, 77 Massachusetts Ave., 2 story, 60x100 ft., laboratory and administration offices, to McCreery & Theriault, 131 Clarendon St., Boston; foundations, to New England Foundation Co., Inc., 376 Boylston St., Boston. Est. **$150,000.**

Tenn., Knoxville—Southern Bell Telegraph & Telephone Co., 310 Broad St., Hurt Bldg., Atlanta, Ga., addn. bsmnt. and 2 floors to present office bldg., to Barge-Thompson Co., 136 Ellis St. N.E., Atlanta, Ga., **$150,000.** Hentz, Adler & Schutze, Candler Bldg., Atlanta, Ga., archts.

INDUSTRIAL BUILDINGS

PROPOSED WORK

Calif., Los Angeles—PLANT—Reliable Mfg. Co., 2636 Humbolt Ave., reconstructing 1 story, wood frame, corrugated iron plant. $60,000.

Colo., Denver—PLANT—Gates Rubber C 999 S. Bway., plans by Wm. N. Bowman C Insurance Bldg., 4 story, bsmnt., 175x185 f rein.-con. mfg. plant. CD 9/2—ENR 9/ under Postwar Projects.

Conn., Naugatuck — LABORATORY Naugatuck Chemical Co., Div. U. S. Rubb Co., Elm St., sketches completed by Fra cisco & Jacobus, 511 Fifth Ave., New Yor 17, N. Y., laboratory bldg.

Ind., Terre Haute—PLANT—Strand Ste Div. Great Lakes Steel Corp., E. F. Patte son, local mgr., Terre Haute, making su veys imprv., exten plant, 27 acre sit Crawford Ave and C & E. I. Ry. $200,000.

Md., Elkton—PLANT BLDGS.—Triump Explosives, Elkton, soon lets contract, 1 frame structures, concrete fdns.

Md., Middle River—PLANT IMPROVEMENTS—P. Tignor, engr. Glenn L. Marti Co., Middle River, soon lets contract ex terior duct work at Plant 2.

Minn., Chatfield—PLANT—M. Shapiero 324 First Ave. SW., Rochester, soybean processing plant, $60,000.

Minn., St. Peter—FACTORY—Johnson Mfg. Co., St. Peter, plans by Pass & Rockey, Mankato, and bids soon 2 story, 55x110 ft. rein.-con. factory addn. $40,000 (not official), J. B. Harris Co., 416 Essex Bldg., Minneapolis, engrs.

N. Y., Jamestown—PLANT—J. P. Danielson Co., J. P. Danielson, Jr., in charge, 583 Allen St., 2 story, brick, steel, concrete tool and wrench mfg. plant addn. $50,000.

Ore., Lyons — SAWMILL — Mt. Jefferson Lumber Co., Lyons, reconstructing sawmill. $175,000.

Ore., Portland—WAREHOUSE—Armour & Co., 420 N.W., 14 St., cold storage warehouse $220,000.

Pa., Phila. — TERMINAL — Associated Transport, Inc., c/o A. J. Carson, archt., 325 Memorial Ave., West Springfield, Mass., terminal addn., G St., incl. grading 4 acre site, bit. roadways and constructing steel and wire fence.

Tex., Brownfield — CARBON-BLACK PLANT—Columbian Carbon Co., N. Houston-Rosslyn Rd., Houston, carbon-black plant.

Tex., Edinburg—PLANT—T. F. Murchison, et al, Alamo National Bldg., San Antonio, recycling plant. Over $200,000.

Tex., Uvalde—WAREHOUSE—H. W. Little, Inc., Uvalde, masonry type warehouse. $40,000.

Tex., Wichita Falls—PLANT—Continental Oil Co., Wichita Falls, reconstructing damaged portion alkylyzation plant, near here. Over $40,000.

★ **Utah, Coalville**—PLANT—Mountain Fuel Supply Co., Rock Springs, Wyo., gasoline absorption and fractionating plant. $944,851.

Va., Roanoke—FREIGHT TERMINAL, etc. —Associated Transport, Inc., c/o A. J. Carson, archt., 325 Memorial Ave., West Springfield, Mass., brick, steel freight terminal and truck garage.

Wis., Superior—STOCK YARDS—Douglas Livestock Co., 1530 John Ave., stock yards.

Ont., Peterboro—PLANT—Canadian Raybestos Co., Ltd., R. Abbott, genl. mgr., Peterboro, plant expansion, Perry St. $45,000.

Ont., Toronto—PLANT—Aulcraft Paints, Ltd., 313 Symington Ave., plans by G. S. Adamson, 96 W. Bloor St., 4 story, bsmnt., 50x60 ft., brick, structural steel, plant addn., concrete fdn. $40,000. CD 5/9.

Ont., Toronto—PLANT—Grimsthorpe Lumber Co., c/o R. W. Brownell, 62 W. Richmond St., forest products mfg. plant. $40,000.

Que., Montreal — STOCKYARDS — Eastern Pub. Cattle Market, 4499 Iberville St., stockyards. $40,000.

Que., Sawyerville—PLANT—International Cooperage Co., Ltd., 30 Seigneur St., Montreal, plant addn., reconstructing storage warehouse, etc. $40,000.

BIDS ASKED

Bids Asked In July

Conn., Middletown — FACTORY — Russell Mgf. Co., 88 E. Main St., 1 story, 100x100 ft. brick, steel factory. Leo F. Caproni, 1221 Chapel St., New Haven, engr. CD 6/13—ENR 6/15.

Bids Asked July 5

Va., Alexandria—ENGINE SHOP—Southern Ry. Sys., B. Herman, ch. engr., McPherson Sq., Wash., D. C., engine shop bldg. Extended date. CD 6/20—ENR 6/22.

Bids Asked July 10

N. Y., Mechanicville — SHOP — Boston & Maine R. R. Co., T. G. Sughrue, ch. engr., 150 Causeway, Boston, Mass., brick shop, Diesel locomotive facilities. Over $40,000.

NDUSTRIAL BLDGS. (Low Bidders, Cont'd.)

OW BIDDERS

S. C., Monck's Corner and Pinopolis—WAREHOUSE—South Carolina Pub. Service Auth., 1246 Main St., Columbia, June 21, warehouse and office bldg., Docket 4329, from General Constr. Co., Columbia Record Bldg., Columbia, **$97,600.** CD 6/8—ENR 6/15.

Wis., Lake Geneva—FACTORY—Lake Geneva Development Corp., 738 Main St., June 1, 1 story, 50 x 180 ft. factory, 2 story, bsmnt., 30 x 50 ft. office, concrete block, concrete fdn., from J. P. Cullen & Son, 109 S. Main St., Janesville, **$56,600.** CD 5/17—ENR 5/18.

CONTRACTS AWARDED

Calif., Los Angeles — EQUIPMENT REPAIR—Shepherd Tractor & Equipment Co., 150 W. Jefferson Blvd., design and construct 1 story, 120 x 180 ft., reinforced brick equipment repair bldg., to Ted. R. Cooper Co., 1031 S. Bway., approx. **$240,000.**

Calif., San Diego — COLD STORAGE — Klauber Wagenheim Co., 611 Island Ave., 2 story,. rein.-con. mill type cold storage bldg., to Trepte Constr. Co., 2001 Ketner St., approx. **$50,000.**

Conn., Torrington — FACTORY — Torrington Co., 59 Field St., brick factory addn., Laurel St., to Torrington Bldg. Co., Inc., 187 Church St. Est. **$45,000.**

Ill., Chicago—FACTORY—Mall Tool Co., 7724 S. Chicago Ave., 1 story, 100x190 ft., brick factory, to Industrial Builders, 53 W. Jackson Blvd. Est. **$60,000.** C. A. Shants, 25 E. Jackson Blvd., archt.

Md., Baltimore — PLANT — Westinghouse Electric & Mfg. Co., Union Bank Bldg., Pittsburgh, Pa., general contract mfg. bldg. addns., alterations, to Morrow Bros., 2310 N. Charles St., **$125,000.**

Mass., Somerville—WAREHOUSE—Standard Lumber Co., J. V. Marino, 8 Porter St., 2 story warehouse, to Marson Constr. Co., 12 Boston Ave., Medford. Est. **$40,000.** CD 6/19—ENR 6/22.

Mass., Worcester—LABORATORY, etc.—Brewer & Co., 12 E. Worcester St., rebuilding 4 story laboratory and warehouse, vitamin mfg. plant, to E. J. Cross Co., 150 Prescott St.

Mo., St. Louis—DAIRY PLANT—Pevely Dairy Co., 1001 S. Grand Blvd., altering, repairing 3 story, bsmnt. dairy plant bldg., 3626-30 Chouteau Ave., separate contracts. **$40,000** with equip. L. Haeger, 3844 Utah Pl., St. Louis, Zone 16, archt.

Mo., St. Louis—PLANT BLDG.—St. Louis Independent Packing Co., 834 South Vanderventer Ave., Zone 10, 4 story, 103x108 ft., rein.-con., brick packing plant freezer bldg., to A. H. Haessler Bldg. & Contg. Co., 2346 Palm St., St. Louis, Zone 7. Est. **$40,000** incl. equip. Bids 5/22.

N. J., Newark—PLANT—Celanese Corp. of America, 90 Ferry St., altering Bldg. 225, dyke walls and tank fdn. to Bldg. 895, to Eustice Corp., 9 Mitchell Pl., **$50,000.**

N. C., Charlotte—PLANT—Swift & Co., 400 S. Mint St., 2 story plant addn., to V. P. Loftis, Builders Bldg., **$70,000.** Bids 6/12. CD 6/6—ENR 6/8.

O., Euclid (br. Cleveland)—FACTORY—Black Boring & Machine Co., L. G. Black, pres., 1400 E. 222 St., 56x145 ft. brick, steel factory, to Douda Building Co., 15526 Euclid Ave., Cleveland. Est. **$40,000.**

Ore. Eugene—PLANT—J. H. Baxter Timber Co., Eugene, wood preserving plant, to Douglas & Wolfe, 608 16 St., Oakland, Calif., **$75,000.**

Pa., Midland—PLANT—Crucible Steel Co. of America, A. L. Sonnhalter, vice pres., Midland, structural steel for 1 story, 100x400 ft., shell mfg. plant, to Fort Pitt Bridge Co., Keystone Bldg., Pittsburgh. Est. **$100,000.** Owner soon takes bids fdns.

Pa., Midland—PLANT—**Treadwell Constr-Co.**, F. G. Gramm, vice pres. in charge, Midland, 1 story, 100x500 ft. mfg. plant, separate contracts; steel and siding, to Fort Pitt Bridge Co., Keystone Hotel, Pittsburgh. Est. **$110,000.**

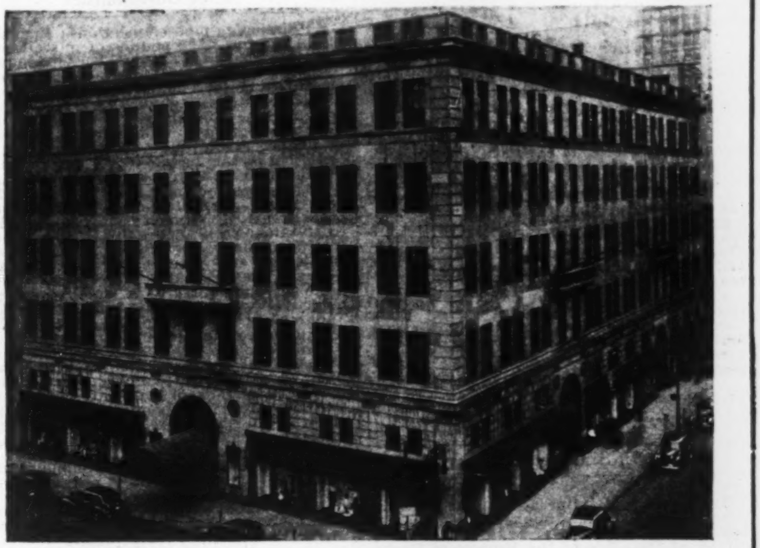
Tex., Houston—PIPELINE CAMP—Humble Bldg., pipeline camp, incl. 250x500 ft. dirt filling on site, concrete bridge, shell paving, base course, water tower, storage garage, water, sewer, gas sys., etc., to Brown & Root, Inc., Box 3, approx. **$100,000.**

Wis., Phillips—GRINDING MILL, etc.—Rabenowich Bros., Phillips, 5 story, 34 x 34 ft., rein.-con. grinding mill, 34 x 42 ft. headhouse and storage bins, 2 story, 90 x 120 ft. concrete block, rein.-con. slab constr. warehouse, to Hogenson Constr. Co., 402 Corn Exchange, approx. **$100,000.**

Ont., Hornepayer—COALING PLANT—Canadian National R. R., B. W. Wheelright, engr., 436 Union Station, Toronto, reinforced coaling plant, to Sterling Constr. Co., Ltd., 2492 E. Sandwich St., Windsor. Est. **$50,000.** CD 5/23—ENR 5/25.

Proposal Advertisements see p. 158 and 180

Postwar Projects see p. 127



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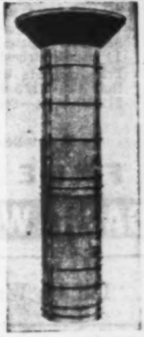

THE HAUSMAN STEEL CO., TOLEDO 1, OHIO

OFFICIAL PROPOSALS

Bids: July 14, 1944 (260)

Sewer Construction

WASHINGTON SUBURBAN SANITARY COMMISSION

Contract No. 173-S

Sealed proposals for constructing approximately 900 feet of 6-inch, 3,325 feet of 8-inch, 1,615 feet of 10-inch, 545 feet of 12-inch, 410 feet of 15-inch and 865 feet of 18-inch vitrified pipe sewers on Contract No. 173-S, will be received at the office of the Washington Suburban Sanitary Commission, Hamilton Street, Hyattsville, Maryland, until 3:00 P. M., Eastern War Time, Friday, July 14, 1944, at which place and time they will be publicly opened and read.

Plans and specifications may be obtained from Harry R. Hall, Chief Engineer of the Commission, Hyattsville, Maryland, upon deposit of $5.00, which deposit will be returned to bidders, or to those returning plans and specifications in good condition.

Perry Boswell
J. Donald Clagett
Frank B. Smith
Commissioners

(U. S. Government)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Washington, D. C., June 15, 1944. Sealed bids (Specifications No. 1075) will be received at the office of the Bureau of Reclamation, Klamath Falls, Oregon, until 10 a.m., July 28, 1944, and then publicly opened, for furnishing labor and materials and performing all work for the *construction of pumping plants "A", "B", and "C"*, Modoc unit, Tule Lake division, Klamath project, Oregon-California. The work is located near Tulelake, California. The principal items of work and the estimated quantities involved for each of the schedules are as follows: *Schedule No. 1*—3,000 cubic yards of excavation, common; 1,200 cubic yards of backfill; 500 cubic yards of compacting backfill; furnishing and placing 26 square yards of dry-rock paving; furnishing and placing 15 cubic yards of gravel around weep holes; 239 cubic yards of concrete in substructure of pump house; 80 cubic yards of concrete in discharge lines and outlet; 23 cubic yards of concrete in canal lining for "J" canal; furnishing and placing 46,000 pounds of reinforcement bars; constructing 9 contraction joints in discharge lines; constructing 3 water-seal joints in discharge lines; furnishing and driving 560 linear feet of vertical timber piles; furnishing and driving 665 linear feet of batter timber piles; constructing pumping plant; installing 2,800 pounds of flap gates; furnishing and installing 6,800 pounds of welded-plate-steel discharge-pipe connections; furnishing and installing 8,500 pounds of miscellaneous metalwork; installing 25,000 pounds of pumping units; installing 200 linear feet of electrical metal conduit 1 inch or less in diameter; installing 70 linear feet of electrical metal conduit more than 1 inch in diameter but not more than 2½ inches in diameter; installing 40 linear feet of electrical metal conduit more than 2½ inches in diameter but not more than 4 inches in diameter; and installing 2,100 pounds of apparatus. *Schedule No. 2*—970 cubic yards of excavation, common; 535 cubic yards of excavation, rock; 550 cubic yards of backfill; 50 cubic yards of compacting backfill; furnishing and placing 40 square yards of dry-rock paving; 190 cubic yards of concrete in substructure of pump house; 59 cubic yards of concrete in discharge lines and outlet; furnishing and placing 37,000 pounds of reinforcement bars; constructing 9 contraction joints in discharge lines; constructing 3 water-seal joints in discharge lines; constructing pumping plant; installing 2,800 pounds of flap gates; furnishing and installing 6,800 pounds of welded-plate-steel discharge-pipe connections and float guides; furnishing and installing 11,500 pounds of miscellaneous metalwork; installing 25,000 pounds of pumping units; installing 260 linear feet of electrical metal conduit 1 inch or less in diameter; installing 80 linear feet of electrical metal conduit more than 1 inch in diameter but not more than 2½ inches in diameter; installing 40 linear feet of electrical metal conduit more than 2½ inches in diameter but not more than 4 inches in diameter; and installing 2,100 pounds of electrical conductors, ground wires, and apparatus. *Schedule No. 3*—1,650 cubic yards of excavation, common; 550 cubic yards of backfill; 50 cubic yards of compacting backfill; furnishing and placing 40 square yards of dry-rock paving; furnishing and placing 200 cubic yards of gravel around weep holes and pump house; 50 cubic yards of concrete in foundation slabs of substructure; 25 cubic yards of concrete in collars and outlet for discharge lines; furnishing and placing 10,000 pounds of reinforcement bars; furnishing and driving 650 linear feet of vertical timber piles; furnishing and driving 300 linear feet of batter timber piles; furnishing, fabricating, and driving 2.5 M ft. b.m. of timber sheet piling; constructing pumping plant; furnishing and installing wood discharge lines; installing 2,800 pounds of flap gates; furnishing and installing 6,800 pounds of welded-plate-steel discharge-pipe connections and float guides; furnishing and installing 2,000 pounds of miscellaneous metalwork; installing 25,000 pounds of pumping units; furnishing and installing 5-ton hoist and trolley; installing 240 linear feet of electrical metal conduit 1 inch or less in diameter; installing 100 linear feet of electrical metal conduit more than 1 inch in diameter but not more than 2½ inches in diameter; installing 40 linear feet of electrical metal conduit more than 2½ inches in diameter but not more than 4 inches in diameter; and installing 2,100 pounds of electrical conductors, ground wires, and apparatus. This invitation for bids does not cover the purchase of materials which are to be furnished by the Government. Materials to be furnished by the contractor, and those furnished by the Government are described in the specifications which will be a part of the contract. The work shall be commenced within fifteen (15) calendar days after date of receipt of notice to proceed and shall be completed within one hundred and eighty (180) calendar days from the date of receipt of such notice. Guarantee will be required with each bid in an amount not less than 10 percent of the amount of the bid. Performance bond will be required in an amount not less than 50 percent of the estimated aggregate payments to be made under the contract. Payment bond will be required in the sum of one-half of the total amount payable by the terms of the contract. Liquidated damages for delay will be twenty-five dollars ($25) per day for each uncompleted schedule for each calendar day's delay. No charge to prospective bidders for copies of the specifications and drawings; to others, $2.50 per copy, not returnable. For particulars, address the Bureau of Reclamation, Klamath Falls, Oregon; Denver 2, Colorado; or Washington, D. C. H. W. Bashore, Commissioner (261)

(Continued on page 180)

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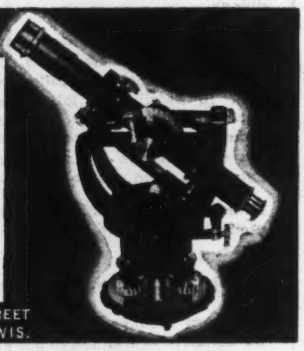

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Well established Los Angeles construction equipment manufacturer needs capable designing engineer. He will head up engineering department now at work on postwar designs of such items as concrete and asphalt finishing machines, subgraders, loaders, concrete spreaders, rollers, etc. National distribution, excellent postwar outlook. Address full particulars to

P-474, Engineering News-Record
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DRAFTSMEN

Minimum of two years experience in Aircraft Drafting. Will consider men with Mechanical, Architectural or Civil Engineering drafting experience.

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Wanted by middle-western manufacturer of heavy mobile machinery. Position requires man with engineering and analytical ability to assist in planning the expansion of current lines and to carry on developmental work generally.

Address reply to
P-475, Engineering News Record
330 West 42nd St., New York 18, N. Y.

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WANTED

Degree in Aeronautical Engineering or Civil Structural Engineering. Minimum of three years experience in Aircraft Stress Analysis preferred.

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To take charge of Concrete Paving, Grading Work and Heavy Engineering Construction in Chicago and vicinity. Old established contractor. State experience, references and salary.

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Adequate living conditions for men and women on Project.

State age, education, experience, salary record, references, and when available under present War Manpower Commission regulations.

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WANTED: Experienced estimator and superintendent. Salary and share of profits. Exceptional opportunity. Give age and qualifications. Northern Michigan. P-481, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

SALES ENGINEER experienced in plate and structural fabrication and erecton serving gas utilities, refinery and chemical industries; middle west area. Excellent future in growing organization. Enclose recent photo. All our employees know of this advertisement. P-480, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

WANTED MECHANICAL engineer: with experience in supervision of maintenance of chemical manufacturing equipment. Old established company, location New York City. Not a temporary position. P-491, Engineering News Record, 330 W. 42nd St., New York 18, N. Y.

CONSTRUCTION SUPERINTENDENT — Experienced industrial installations, foundations, piping, also millwright work by prominent constructors for eastern Pennsylvania. Write fully recent experience. P-492, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

FOREMAN with skilled followers for industrial high pressure piping, located Eastern Pennsylvania. Write recent experience. P-493, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

SALES PROMOTION manager wanted — Established eastern manufacturer of specialty coatings for waterproofing and protecting concrete and steel, with agents in principal states, is looking for a man who is capable of taking charge of sales promotion and advertising work. The right man should be able to train new agents and plan sales and follow up programs in new territories. Give age, details of past experience, etc. Salary open. Answers will be kept strictly confidential. P-499. Engineering Newa-Record, 330 W. 42nd St., New York 18, N. Y.

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ENGINEERS — Mechanical — Industrial — Electrical — Chemical — Civil — Architectural, etc. Our specialized service to Tecnnical and Scientific men only for over 50 years, continuously at the same address enable us to offer a fine selection of positions for high grade Manufacturing Executives, Production Managers, Metallurgists and Technical men of all types. The Engineering Agency, Inc., 53 W. Jackson Blvd., Chicago 4, Ill.

POSITIONS WANTED

CIVIL ENGINEER. 39, desires connection as member or associate in midwest engineering firm engaged in municipal or structural consulting work. Prefer Iowa or adjacent state. Could take over small practice completely. Licensed. PW-441. Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

ESTIMATOR: General construction, practical field man, wide experience all types buildings, masonry and concrete structures, water and sewage disposal plants, piping, railroad structures, carpentry etc. Structural engineer competent to take charge of estimating, bids and purchasing, and experienced in management. Age 52, wants responsible place in General Contractors organization. Location immaterial, now located in Middle Atlantic States. PW-467. Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

(Continued on page 160)

SEARCHLIGHT SECTION

POSITIONS WANTED

(Continued from preceding page)

CIVIL ENGINEER: Graduate. 35 years experience: design, construction, industrial plants; Water supply, hydro-electric developments, PW-336, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

CONSTRUCTION SUPERINTENDENT 30 years experience erected 40 Million Dollars worth of various kinds of structures, recently Housing, Hospitals, Schools, Industrial Plants. Alteraton-Wood Masonry. Concrete and Steel Construction also. Shoring and Underpinning. Location immaterial. PW-374. Engineering News-Record, 330 W. 42nd St., N. Y. 18, N. Y.

CONSTRUCTION SUPERINTENDENT — 45 — exceptional record of fast completions and economical administration over many years. Well recommended by past employers. Heavy construction, concrete and steel structures, bridges and all types of waterfront construction and difficult foundations. Present project nearing completion. PW-378. Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

CONSTRUCTION SUPERINTENDENT. Wide experience industrial and municipal construction including mechanical installatons. PW-466. Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

CIVIL ENGINEER. Twenty-three years general and specialized experience including eight years consulting. Can obtain written release. PW-436. Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ENGINEER-DESIGNER, graduate civil engineering, age 44, 20 years varied experience in roads, municipal, and general civil engineering design, desires reasonably permanent supervisory position with post-war future. Available August 1. PW-484. Engineering News-Record, 520 N. Michigan Ave., Chicago 11. Ill.

SUPERINTENDENT age 53, twenty-five years building roads, streets, sewers etc. Last nine years charge of construction and maintenance on government reservation now closed. Interview desired. Now located central New York. PW-489. Engineering News-Record, 330 W. 42nd St., New York, 18, N. Y.

STRUCTURAL DESIGN Engineer, Graduate C.E. Age 41, 19 years experience design—steel, concrete and timber structures, such as shipways, docks, quays, waterfront structures, industrial, commercial, office and apartment buildings. Capable of taking charge of all design work and preparation structural plans. PW-361. Engineering News-Record, 68 Post St., San Francisco 4, Cal.

CIVIL ENGINEER, Graduate, 20 years design, construction, estimates, specifications, subways, buildings, foundations, power plants, docks, steel, concrete, and timber structures. PW-113, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ENGINEER available to take charge of design, construction, or maintenance of industrial plants, airports, or other projects requiring building work and heavy construction. Over 35 years experience. University of Michigan graduate and registered in Michigan. PW-494, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

CIVIL AND CONSTRUCTION engineer—B.S. C.E. M. Am. Soc. C.E. age fifty-five. Experience—teaching, investigatons, reports, design, construction and maintenance of municipal services. Prefer univirsity, city engineer or manager in the southwest. PW-495, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

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With over 25 years successful experience in General Building and Heavy Constructions, Foundations, Ground Stabilization, Hydraulic Dredging, Waterfront Development and Camp Operation IS NOW AVAILABLE.

Has just completed 4 years contract costing over $100,000,000.

Can provide own personnel in all branches, including administration, electrical and mechanical, for either domestic or foreign assignments.

PW-459, Engineering News-Record
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Many years head of own construction company, largest concerns in the U. S. as clients. Ten years recent top government official handling construction industry. Nationally known by general contractors, architects, engineers, manufacturers of construction products, Labor and Government Officials.

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PW-472, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

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SW-471, Engineering News-Record
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(Additional Auction Ad page 181, Equipment Wanted Ads page 174)

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2—5 cubic yard Full Revolving Locomotive Type Steam Cranes, with 100 ft. booms.
2—15 ton **Industrial-Brownhoist** Gasoline Crawler Cranes, with 75 ft. booms.
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1—Model 600-A **P. & H.** Gasoline Crawler Crane, with 60 ft. boom, and with Dragline Attachment.
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1—100 ft.Booms suitable for 10 to 20 ton Cranes, can be made 70 ft.
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2—300 ft. **American** Tubular Steel Towers.
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Large stock of Parts for all types of Tubular Towers.
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1—Model 21-S **Parsons** Trenching Machine.
1—**Cleveland** Combination Backfiller and Tamper.

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1—75 ton Steel Stiff Leg Derrick, with 120 ft. boom.
1—50 ton Steel Stiff Leg Derrick, with 100 ft. boom.
2—25 ton Steel Stiff Leg Derricks, with 100 ft. booms.
2—15 ton Steel Stiff Leg Derricks, with 75 ft. booms.
1—10 ton Steel Stiff Leg Derrick, with 75 ft. boom.
2—40 ton Steel Erectors Guy Derricks, with 100 ft. booms.
2—20 ton Steel Erectors Guy Derricks, with 100 ft. booms.
2—10 ton Steel Erectors Guy Derricks, with 90 ft. booms.
2—15 ton **Chicago** Steel Booms, complete with Ball Bearing Fittings and Blocks.
2—9" x 10" Double Cylinder, Triple Friction Drum Steam Hoists, with or without Boilers.
2—8" x 10" Double Cylinder, Triple Friction Drum Steam Hoists, with or without Boilers.
2—7¼" x 10" Double Cylinder, Double Friction Drum Steam Hoists, with or without Boilers.
4—50 H. P. Double Drum Gasoline Hoists, with or without Swinging Attachment.
4—50 H. P. Single Drum Electric Hoists.
2—35 H. P. Double Drum Gasoline Hoists, with or without Swinging Attachments.

PUMPING OUTFITS

4—4 inch Self-Priming Centrifugal Pumping Outfits on Wheels with Gasoline Engines.
4—3 inch Self-Priming Centrifugal Pumping Outfits on Wheels with Gasoline Engines.
4—2 inch Self-Priming Centrifugal Pumping Outfits on Wheels with Gasoline Engines.
1—6 inch Dredging Centrifugal Pump, for Belt or Electric Drive.
1—10" x 10" Centrifugal Pump, direct connected with 75 H. P. Electric Motor.

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2—3 cubic yard **Smith** High Discharge Truck Mixers on Fords with Thornton•Drive.
4—4 cubic yard **Smith** High Discharge Truck Mixers on Chain Drive Macks.
3—3½ cubic yard **Jaeger** Truck Mixers on Chain Drive Macks.

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1—50 ton **American** 0-4-0 Standard Gauge, Saddle Tank, completely re-built.
1—15 ton **Industrial** Standard Gauge Locomotive Crane, with 40 ft. boom, Steam.
1—20 ton American Standard Gauge Locomotive Crane—Steam—with 46' boom.

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1—Model 315 **Ingersoll-Rand** Portable Two Stage Gasoline Engine Driven Compressor.
1—Model 315 **Worthington** Portable Two Stage Gasoline Engine Driven Compressor.
2—310 cu. ft. **Ingersoll-Rand** Portable Single Stage Compressors.
2—220 cu. ft. **Ingersoll-Rand** Portable Single Stage Compressors.
2—160 cu. ft. **Ingersoll-Rand** Portable Single Stage Compressors.
2—110 cu. ft. **Ingersoll-Rand** Portable Single Stage Compressors.
1—160 cu. ft. **Schramm** Portable Single Stage Compressor.

CONCRETE MIXERS

2—56-S **Smith** Tilting Type Mixers for Gasoline or Electric Drive.
2—28-S **Smith** Non-Tilting Type Mixers with Gasoline Engine Drive.
2—28-S **Ransome** Concrete Mixers with Electric Motors.
2—21-S **Ransome** Concrete Mixers with Electric Motors.

MISCELLANEOUS

1—9-B-2 **McKiernan-Terry** Steam Pile Hammer, also suitable for air.
1—No. 5 **McKiernan-Terry** Steam Pile Hammer, also suitable for air.
2—Swinging Attachments suitable for Gasoline, Steam or Electric Hoists.
2—Counter-weight Drums for operating clam shell buckets.
1—**Fairlead** Attachment for one yard Browning Crane.
1—50 ton Triple Weighted Crane Block with Swivel Hook.
2—50 ton six-sheave Wire Rope Blocks with Shackles.
2—25 ton **Yale** Spur Geared Chain Hoists with Extra Lift.
2—4 inch High Pressure **Jetting** Pumps with Gasoline Engines.
2—3 inch High Pressure **Jetting** Pumps with Gasoline Engines.
1—10 ton Gasoline Road Roller, **Buffalo-Springfield.**
1—15 ton Gasoline Road Roller, **Buffalo-Springfield.**
1—300 H. P. **Scotch Marine** Type Boiler with Fittings.

WILLIAM P. SWIFT, Incorporated

1248 Commercial Trust Building, **Telephone RITtenhouse 62-64** **Philadelphia 2, Pennsylvania**

1—Parsons Mixing in Place Turbo, pneumatic tired mounted, vane width 8'6", blade width 10'.

1—Rebuilt Wisconsin Model SU power unit, 4" bore, 5" stroke, 35 H. P., complete with steel housing and clutch.

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BALTIMORE, MARYLAND

Industrial Equipment

15-ton Industrial-"Brownhoist" Gasoline Locomotive Crane.
17½-ton Industrial Steam Locomotive Crane.
1—30-ton McMyler Steam Locomotive Crane.
2—27E Paving Mixers.
1—54" Upright Code Boiler.
Standard gage Nordberg track-shifter.
Standard and Narrow-gage Industrial Equipment.

WANTED—60" Upright Code Boiler

We will rebuild your equipment for you

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CARS — CRANES — COMPRESSORS
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AC TRACTORS with BAKER BULLDOZERS—late models K and L completely rebuilt in our own shops—guaranteed
IR COMPRESSORS—two stage, air cooled—models 105 and 315.
Also scrapers, graders, rollers, ditchers, hoists, mixers, etc.

FOR RENT

AC TRACTORS with BAKER BULLDOZERS
Models HD10 and HD14—new 1940 to 1942
IR MOBILAIR COMPRESSORS, Models GK105 and 315
JB5 Jackhammers—CC80 Paving Breakers
Write for complete listing

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ALBANY, N. Y., Phone 4-0159 **SYRACUSE, N. Y., Phone 6-3141**

TWIN CENT. PUMPS.

2 — 10x8" Twin horiz. Allis-Chalmers cent. pumps, Ser. #19674 & 19673. Each pump direct connected with motor in middle. Power 500 H.P. A.C. elect. motor, 2200 V., 60 cy. 3 ph. Cap. 3300 G.P.M. @ 100# pressure, each pump.

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U. S. soldiers are tested under fire before they leave for the war front. **E. C. A.** construction equipment is tested under its own power before it leaves any of Equipment Corporation's rebuilding plants. It must pass by a wide margin because it is GUARANTEED.

TAMPING ROLLERS

3 Section:

1 — Contractor Mach. Co. roller, 88 ft. per sec., wt. full water 15,800#.

1—Blaw Knox roller, 112 ft. per sec. wt. full water 15,800#.

1—Heil roller, 64 ft. per sec. wt. full water 15,800#.

2 Section:

1—Blaw Knox roller, 91 ft. per sec. wt. full water 9,200#.

1—Roller, 72 ft. per sec., wt. full water 9200#.

AIR COMPRESSORS

1—1190 cu. ft. Ing. Rand 2 stage comp. Requires 206 H.P. to operate at 100 lb. pressure.

1—940 cu. ft. Sullivan, 2 stg., with 150 H.P. A.C. elect. mtr.

1—309 cu. ft. Chgo. Pneu. air comp., power 2 cy. Diesel engine.

1—347 cu. ft. Sullivan, class' W13, 2-stage comp. power 112 H.P. Diesel engine.

1—200 cu. ft. Chgo. Pneu. comp. power Diesel engine.

1—Air receiver, 60" dia. x 120' long.

PORTABLE:

1—315 cu. ft. LeRoi, 2 stg. mtd. on 4 pneu. tires.

1—210 cu. ft. Ing. Rand, 2 stg. mtd. on 3 steel wheels.

5—160 cu. ft. 2 stg. Ing. Rand, LeRoi, Davey and Worthington, on pneus. and steel wheels.

6—105 cu. ft. 2 stg., C.P.T., Ing. Rand and Davey, mtd. on pneus. and steel wheels.

Also a number of sgl. stg. port., 110 to 330 cu. ft. disp'l.

BUCKETS

40—Various sizes. Clamshell, dragline, dragscraper, orange peel. All makes.

CONCRETE BUCKETS

54—Concrete buckets from ½ to 5 yd. cap., bottom dump & tip over type, Blaw-Knox, Union, Wiley, Steubner, Stange, Heltzel, Lockwood and Insley.

CRANES AND SHOVELS

1—1¼ yd. P & H Model 650, Serial #4173, 55' boom.

1—1¼ yd. Erie gas air Model GA2, Serial #9758, with 45' boom and shovel attachment.

1—1 yd. Model 600 P & H, Serial #3502, 40' boom & backhoe attach.

1—¾ yd. Koehring crane, Model 301, with 45' boom, Serial #772, Gasoline powered.

1—¾ yd. Conco, Serial #1304, 30' boom.

1—¾ yd. P & H, Model 400 crawler crane, Serial #4186, with 40' boom, gasoline powered.

1—½ yd. Northwest #2, Serial #2903, with 32' crane boom and shovel attach.

1—½ yd. P & H shovel, Model #204, Serial #2303, gasoline powered.

1—¾ yd. Erie Model B2 crawler crane, steam powered, Serial #4027, with 50' boom and shovel attachment.

All this equipment is owned by us and may be inspected at one of our plants.

LOCOMOTIVE CRANES

4—25 Ton Loco. cranes, Browning & Industrial, oil fired, 40-45 and 50' booms.

1—15 Ton Bucyrus Erie coal fired, 40' boom.

FINISHERS

4—Ord finishing machines, gas power, with 10, 18 and 20' screeds.

PAVERS

14—27E Pavers: Foote, Rex, Ransome, Smith and Koehring.

SCALES (Wheelbarrow)

3—Johnson "Little Titan," 3 beam.
8—Howe and Fairbanks-Morse, 3 beam.
4—Winslow, 3 beam.
1—Gaston, 3 beam.
1—Fairbanks-Morse, 2 beam.
1—Gaston, 2 beam.
2—Johnson "Little Titan," 2 beam.

VIBRATORS

Mall, White, Master Elect., Jackson and Viber Vibrators, gasoline or elect. powered.

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INGERSOLL-RAND AIR COMPRESSORS

1—500 cu. ft. actual air, 2 stage, model XOB electric motor drive, 4 wheel or steel skid mounting.

4—310 cu. ft. P.D. single stage, 217 cu. ft. actual air, type 20, 10" x 8", gas engine drive, 4 wheels.

McKIERNAN-TERRY DOUBLE ACTING PILE HAMMERS

1—#9B3 with flat or bell bottom block.

1—#7 with flat or bell bottom block.

HIGH PRESSURE, CENTRIFUGAL JET PUMPS, GAS ENGINE DRIVEN

4—3" x 3" COMPLETE single stage, 350 GPM, 140 lbs.

5—4" x 3" COMPLETE two stage, 350 GPM, 194 lbs.

1—4" x 3" LeCourtenay five stage, 350 GPM, 217 lbs.

1—6" x 3" COMPLETE three stage, 1200 GPM, 109 lbs. 600 GPM, 208 lbs.

PUMPS

4—COMPLETE 10" special self priming centrifugal pumps, 5000 gallons per minute, gasoline engine or electric motor drive, skid mounted.

We also have for immediate shipment a good stock of both new and used pneumatic tools of various types, air hose, smaller size self priming centrifugal, plunger and diaphragm pumps, all sizes suction, discharge and jetting hose, 2 to 6 KW gasoline engine driven generator sets, concrete vibrators, and air driven chain saw machines.

All the equipment in our stock (more than 400 pieces) is available on a rental basis.

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COMPLETE Machinery & Equipment Co., Inc.
36-42 Eleventh St., Long Island City 1, Queens, N. Y.

For Rental or Sale

2—Gasoline Powered Saw Tables, 12" blades
2—Gasoline Powered Saw Tables, 16" blades
1—Gasoline Powered Saw Table, 20" blades with band saw attachment
1--160 Dbl. Pumpcrete Machine with remixers, complete with pipeline and accessories
2—60-HP D.D. gasoline hoists

For Sale

2—Backhoe attachment for Model 105 Northwest
1—5 KW. 40 amp., 125 Volt, General Electric Generator, Type GM23; 8-10 HP gasoline engine; Speed 750 RPM
1—T.D. 40 International Tractor complete with Hydraulic Trail Builder
1—10x8 Ingersoll-Rand Portable Compressor. Displacement 315 cu. ft., 4 steel wheels
1—240 Actual Delivery Chicago Pneumatic Compressor, 4 steel wheels
3½-S—7-S—10-S—14-S Concrete Mixers
Centrifugal Pumps 1½" to 8", portable gasoline engine driven
1—Model 110 I-R Compressor, mounted on G.M.C. Truck
1—40' Boom for 105 Northwest Crane

FURNIVAL-RIMMER CO.

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2000 HP DIESEL PLANT

7 BUCKEYE DIRECT CONNECTED SETS

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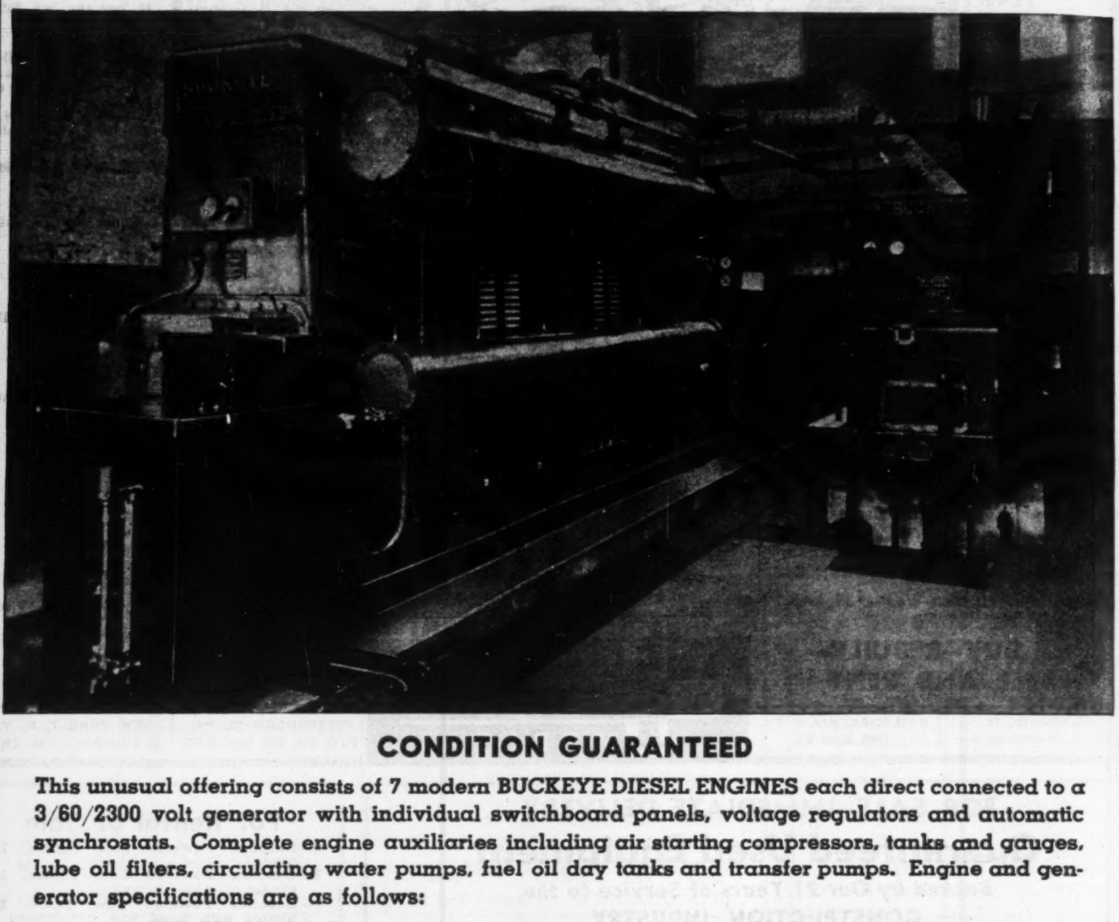

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This unusual offering consists of 7 modern BUCKEYE DIESEL ENGINES each direct connected to a 3/60/2300 volt generator with individual switchboard panels, voltage regulators and automatic synchrostats. Complete engine auxiliaries including air starting compressors, tanks and gauges, lube oil filters, circulating water pumps, fuel oil day tanks and transfer pumps. Engine and generator specifications are as follows:

1—675 HP Model 0 6 cyl. 13½ x 15½—D.C. to 450 KW Generator 360 rpm
1—260 HP Model E 7 cyl. 9½ x 14—D.C. to 175 KW Generator 400 rpm
2—240 HP Model 70 5 cyl. 10 x 12—D.C. to 150 KW Generator 514 rpm
1—190 HP Model 70 4 cyl. 10 x 12—D.C. to 150 KW Generator 514 rpm
2—150 HP Model E 4 cyl. 9½ x 14—D.C. to 100 KW Generator 400 rpm

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DIESEL SALES ENGINEERS

P. O. BOX 232 PHONE ROSLYN 1220

PORT WASHINGTON, L. I.

NEW YORK

IMMEDIATE SHIPMENT

WHIRLEYS

1—Williams 15'1" gauge, steam, 85' boom, 3 yd. clamshell bucket.

1—Williams 15'1" gauge, steam, 84' boom, 2 yd. clamshell bucket.

1—Williams 15'1" gauge, steam, 65' boom, 3 yd. clamshell bucket.

SELF PROPELLED SUCTION DREDGES

1—S. S. Lakewood. 260' long; 38' beam; load draft 16'; capacity 1265 yds. gravel; 24" dredge pump.

1—S. S. Weston M. Carroll. 200' long; 38' beam; registered depth 11'6"; capacity 1010 yds. gravel; 15" dredge pump.

HOISTS

1—Flory single drum mine hoist—10500# at 450 ft. per min. 52" diam. drum, 36" between flanges, with or without power.

1—American, double drum with swingers, 10000# at 200 FPM gasoline or electric power.

1—Lidgerwood, double drum, 7000# at 175 FPM, gasoline power.

6—Lambert single drum, 1500# at 750 FPM, gasoline or electric power.

6—Lambert single drum, 5000# at 200 FPM, gasoline or electric power.

3—Lambert double drum, gasoline power.

1—Clyde double drum, 4000# at 250 FPM, gasoline power.

1—Mundy double drum, 4000# at 185 FPM, electric power.

1—Clyde single drum, with 2 pony drums, 3000# at 135 FPM, electric power.

CLAMSHELL BUCKETS

8—½ to 3 yd. rehandling buckets.

PUMPS

1—24" Sterling electric deep well pump, 5000 GPM at 40' head.

1—18" Layne-Bowler deep well pump 3000 GPM at 120 ft. head, new.

TRUCK MIXER

1—Rex 2 yd. horizontal truck mixer mounted on Autocar trucks.

PUMPCRETE

1—Rex 200 double electric powered pumpcrete, with approximately 400 ft. of 8" pipe. Can furnish with gasoline power.

ROLLERS

1—Galion Chief, 10 ton, 3 wheel, gasoline powered rollers, hydraulic steering and scarifier, canopy top, sprinkler water tank, Hercules gasoline engine, completely rebuilt.

2—Hercules 10 ton, 3 wheel, diesel powered rollers, hydraulic steering and scarifier, electric starter, completely rebuilt.

6—Buffalo-Springfield, 10 ton, 3 wheel, gasoline powered, road rollers, Waukesha engines with or without scarifiers, completely rebuilt.

3—Galion Warrior, 8 ton, 3 wheel, hydraulic steering, hydraulic scarifier, canopy top, sprinkler water tank, piping to all rolls, Hercules engines with electric starters, completely rebuilt.

DEMPSTER DUMPSTERS

7—Truck mounted, each with 5 two yd. buckets.

BARBER-GREENE CONTINUOUS MIX PLANT

Model 848, normal duty, pneumatic tired, gasoline powered with side conveyor.

STACKERS AND CONVEYORS

1—Barber-Greene 24" x 105' radial belt stacker, in practically new condition.

1—Barber-Greene 24" x 97' crawler mounted, electric powered stacker, completely rebuilt, immediate shipment.

1—24" x 120' Stephens-Adamson conveyors, as above described, but with inverted truss type suspension members between bents, as is or completely rebuilt.

1—24" x 243' Link-Belt steel channel frame conveyor, with anti-friction idlers, head and tail mechanism, drive mechanism, automatic gravity take-up, with bridge type structural steel support frame, and belt tripper.

QUARRY EQUIPMENT

4—Traylor 12" Bulldog gyratory crushers.

1—Telsmith, Model 40-B, gyratory reduction crusher, completely rebuilt, immediate shipment.

1—Cedar-Rapids No. 4 "Kubit" impact breaker, used as demonstrator only.

1—Portable crushing plant with Wheeling 15 x 38 primary jaw crusher, 16 x 24 New Holland roll crusher, necessary elevator, screen, bin, drives, chutes, etc., gasoline or diesel powered.

1—Cedar-Rapids 10 x 36 primary jaw crusher with Cedar-Rapids 16 x 16 roll crusher, with accessories mentioned above.

1—Cedar-Rapids 10 x 24 jaw crusher with New Holland 16 x 16 roll crusher, with accessories mentioned above.

.—Allis-Chalmers 2410 fine reduction jaw crusher, in excellent condition.

1—Telsmith size 18 intercone crusher, in excellent condition.

1—Telsmith size 28 intercone crusher, in excellent condition.

SHOVELS AND CRANES

1—General ½-yard gasoline powered Crane, to be rebuilt. Delivery 60 days.

1—Northwest Model 5 gasoline powered Dragline, with 45' boom. As is or rebuilt.

COMPRESSORS

1—Schramm Model 105 gasoline powered Compressor, on 4 steel wheels.

2—Schramm Model 210 gasoline powered Compressors, on 4 steel wheels.

2—Schramm Model 260 gasoline powered Compressors, on 4 steel wheels.

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DUMP TRUCKS—SEMI-TRAILERS

Diesel and Gas

TRACTORS—TOURNAPULLS

18 to 20 yards Diesel	Euclid Bottom dump trucks built in 1941 or 1942. Tires 18.00x40. Twelve for sale.
12 to 15 yards Diesel	Euclid End Dump trucks—1941 or 1942 model FD. Nine for sale.
20 to 23 yards Diesel	1942 Model six-wheel Maxi two-way dump trucks with 200 HP Cummins Diesel Engines. Three only.
12 to 15 yards Gas	Federal Models 29 and 45. 8 yard water level—12 yard heap—built in 1942. Fruehauf rear end dump trucks.
15 tons Diesel	Four 1941 Euclid Model 5FD end dump trucks with Cummins HB-6 engine.

A REAL BARGAIN

Five Euclid Model 11FD rear dump trucks, equipped with 200 HP Cummins Model 6HB1SD Supercharged Diesel Engine. 10 to 12 yards capacity. 14.00x24 tires. Wire for details.

10 to 13 yards Diesel	Three Euclid Diesel Bottom Dump Trucks, Model FDT, 6 cylinder Model H Cummins Diesel Engine 150 HP Semi-trailer Model 47W bottom dump.
11 to 13 yards Diesel	Two GMC Model IKGT Euclid diesel bottom dump trucks, powered by Model 4-W GMC Diesel Engines.
12 to 14 yards Mack-Diesel	Three Model AP Mack Dump Trucks, Cummins Diesel HB 6 motors, 7 speed trans. air brakes, 2 reverse gears, 12 yd. bodies telescope hoists—late style Webbed Torch Arms, frames specially reinforced—2 sets of rear springs—very large rear axles.
14 yards	Three Oshkosh Tractor—Wagon units, Model RXC. 4 wheel drive Streich Trailers. Tires 18.00 x 24 all around. Overhauled.
11 to 13 yards Diesel	Four General Motors Diesel Dump Trucks 1941 Model. Capacity 11 yd. bodies. Model ADCx74. Have average dual transmission, air brakes, steel body, and are in exceptionally good condition. Tires 12.00x20. Gallo Hoist and Heil Bodies.
3 tons Dodge Gas	Two 3 ton Dodge special, equipped with Thornton Tandem drive. 9.00x20 tires all around. Excellent condition, used 6 months.

$15,000.00 for Three 10 to 12 yard 1940 Euclid Diesel Bottom Dump Trucks powered by Cummins Diesel Engines. Model KDT. Extremely good buy. *Wire or phone.*

12 yards Titan	Six 6-wheel Titan Dump trucks 12 cu. yd. serial numbers in the 4000s.
9 to 12 yards Diesel	Five Model 3KDT Bottom Dump Euclids. Latest type and equipped with 4 cylinder General Motors Diesel Engines which develop 110 HP at 1800 RPM. Big Euclid "F" axle and 21.00 x24 tires on tractor drive and trailer wheels.

9 yards Diesel-Euclid	Five Euclid Bottom Dump Trac-Truks Model 3KDT with GMC diesel 4 cylinder engines. Tires 21.00x24.
10 yards Gas	Ten 10 yd. Euclid gas powered BOTTOM DUMP TRUCKS.
Mack	Two BX Chain Drive Mack Dump Trucks. New motors installed last year. Tires are in fine condition, and both have spares which are in perfect condition.
10 to 12 yards Dodge	Five Dodge Dump Trucks 10-12 yd. Bodies.
6 yards Koehring	Three Koehring Dumptors, serial numbers in the D700s.
5-6 tons Chevrolet	Two Chevrolet Dump trucks—recent models.
One lot of Trucks	One 2-ton White 1937. One 5-yd. Ford 1939. One 5 yd. GMC 1938. One 4-yd. Chevrolet. One 4 yd. Ford 1935. One ½ ton 1936 Pickup Truck. All in operating condition. Good tires. Several tires are new.

DUMPTORS

Six Koehring Dumptors, Model W55, 6 yd. capacity. Equipped with pneumatic tires.

5 yards Gas	Two Sterling Dump Trucks—5 yd. dump bodies.
5 yards Sterling	One Sterling Truck—6-cylinder Waukesha Motor, 90 HP, 1800 RPM, dual rear tires 40x8, 38x7 front—completely rebuilt.
5 yards Reo	Two Reo 1942 Dump Trucks Model 23 BRS equipped with Hercules Dump Bodies, 5 cu. yd. capacity. Heavy duty hoists—Timken 2 speed rear—10/20 tires—fishplated frame—larger capacity spring. Tail hooks front and rear heavy duty dump body and hoist. Has a 4 speed transmission vacuum reserve tank.
5 ton Mack	One AC 5 ton Mack Dump truck about 10 years old—good mechanical condition, 75% rubber.
5 yards White	Two 1935 White 702 trucks—5 yards.
4 yards Ford	Three 1940 Ford Dump trucks. Equipped with B.K. power brakes. Chassis is all fishplated. They all have practically new 8.25x20 tires in the rear and 7.50x20 tires in front. Springs have all been built up. Rebuilt motors 100 HP. They have the heavy 2-speed Baumiss rear ends instead of regular Ford rear end.
3½ to 6 yd. Dodge	One 1941 Dodge 3½ to 6 yd. truck with Heil dump body.
3½ yd. Oshkosh	One Oshkosh truck, Model F-6, 3½ yd. dump body, Chassis #743, new tires. Overhauled and guaranteed.
3 ton Dodge	Two Dodge dump trucks 3 ton factory rating. Good condition.
3½ yd. White	One White Dump Truck—6 tons—3½ yd. with mechanical hoist. Will sell very cheap if Government will allow shipment to USA from Canada.

3 yard Ford	Two Ford 1939 Model 3 yd. dum body.
3 yd. Chevrolet	Five 1940 Model Chevrolet Dum with 3 yd. water level bodies.
2½ yd. International	One 1939 International 2½ yd. dum truck.
1½ ton International	Two 1939 1½ tons International Dum Trucks in good condition.
1½ ton Ford	One 1939 Ford 1½ ton dump truck in good condition.
1½ ton Chevrolet	One 1939 Chevrolet 1½ ton Chevrolet dump truck.

One lot of 11 Trucks Very reasonable

One 1942 Ford 1½ ton dump truck
Five 1941 Ford 1½ ton dump trucks
Four 1939 Ford 1½ ton dump trucks
One 1940 Ford 2 ton 2 speed rear dump truck

A good Section of Crawler Type Dump Trucks from 6 yards to 18 yards capacity. Write for further details.

Model C 12½ to 15 yards	Five Super "C" Tournapulls, first class condition. Capacity 12½ to 15 yards. Cutting Width 8'6". Approx. weight 31,000#. Tires very good hydraulic brakes 150 HP engine. Over-all measurements: 32'2" length, 10'2" width, 11'2" height, 22'0" wheelbase.
Model A 21 to 30 yds.	Three Model "A" tournapulls, first class condition. 160 HP 950 RPM Engine. Capacity 23 to 30 yds.—cutting width 10'-hydraulic brakes.
Model C 8.2 to 11 yds.	Six Model "C" Tournapulls A-1 condition, very good tires.
Model C 8.2 to 11 yds.	Two 1940 Model "C" Tournapulls first class condition with LS scrapers.
LINN TRACTORS	Five 1941-1942 Linn Tractors, fou gas and one diesel.
White Tractor	One 5 ton White Tractor, Model 95A. 90% rubber.
International Tractor	One 10 yard gas International Tractor.
Dodge Tractor	One 1940 Dodge Tractor—2 tons—2 compartment 300 gallon trailer.

SPECIAL

50 Ton Trailer with Autocar

One Autocar equipped with 8 pneumatic tired 50 ton Freuhauf Shovel Trailer. Autocar equipped with double transmission, 12 speeds, double rear ends. Air brakes—large winch and cables mounted on Autocar. In excellent condition. *Write for further particulars.*

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NEW YORK

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for SAVINGS *in* BUYING
and SPEED *in* SELLING

SHOVEL and CRANE SPECIALS

e (1) ⅜ yd. Bay City Tractor Shovel—Serial number in 1100s—powered by an International 4-cylinder gas engine. Offered in good condition—Standard shovel front and dipper stick, dipper bucket and manganese dipper front with four manganese teeth. According to the inspector's report, the gears show very little wear, the crawler pads are 14" wide and the condition of the crawler pads is good. A nominal amount of work could be done on the tracks in order to bring them into good shape. However, it could be used as is for quite some time to come. No cab on the machine. Location — Michigan. 5359) #26 ....PRICE $2450.00

e (1) Byers crawler crane and backhoe combination —25' crane boom, skimmer scoop, backhoe attachment. Located—New York City. With all three attachments only—#28....PRICE $2550.00

e (1) Fundum Shovel ⅜ yd. capacity—has been rebuilt recently and is in good working condition. Located—Maryland. #29....PRICE $1950.00

Real bargain is one ⅝ yd. Insley Shovel, Crane and Backhoe combination. The gears are perfect—the engine is excellent, and all in all, the unit is a very desirable one to have. Located in Schenectady, New York. Including a ½ yd. clamshell bucket, 35' crane boom, backhoe and shovel attachments only—#30 PRICE $4450.00

nother attractive buy we would like to call your attention to is a ⅝ yd. Byers crawler crane, Serial number in 4200s with 25' crane boom, backhoe attachment, 18' backhoe boom, skimmer scoop. This machine has been used for only five or 6 years—in excellent condition. The backhoe bucket dimensions are 30x30x24 and the skimmer scoop is 30x30x22. Located in New England. #31....PRICE $2280.00

e (1) ½ yd. General Shovel and Crane combination —power supplied by a Buda Gas Engine. Machine is in good operating condition. Located—Pennsylvania. #32 ....PRICE $4300.00

e (1) ½ yd. General Shovel with a 6-cylinder Buda Motor and ½ yd. bucket—Located Colorado. #33 PRICE $3250.00

e (1) yd. Insley Excavator—powered by a 4-cylinder Model KTU Buda Engine—28' boom and bucket. Located in Arkansas. #34....PRICE $3550.00

e (1) Insley Excavator Type R95—½ yd. Owens bucket and 30' crane boom—shovel front—18' dipper stick. General condition of machine is good. Located Up-State New York. #35....PRICE $3400.00

e (1) Speeder ½ yd. dragline with 35' boom, ½ yd. Page dragline bucket—powered by Hercules Gas Engine—condition real good. Located—Illinois. #36 PRICE $5900.00

e (1) Model B3 Speeder ⅝ yd. with 80 H.P. Model "L" Hercules gasoline engine—backhoe ½ yd. 36" wide trench hoe attachment. Machine was rebuilt in 1943. Located Up-State New York. #37 PRICE $4900.00

e (1) Linkbelt Speeder Model B3—⅝ yd. capacity—machine is in fairly good condition. Located in North Dakota. #39....PRICE $5400.00

e (1) Thew Lorain ½ yd. shovel and crane combination—gas powered—Serial number in 3000s. Located in New England. #40....PRICE $4400.00

e (1) ⅝ yd. Mead-Morrison Shovel with AMSCO ⅝ yd. heavy-duty bucket—power supplied by Hercules Model "G" 4-cylinder gas engine. A Real Bargain. Located in New England. #41. PRICE $2750.00

e (1) ¾ yd. Model 16B Bay City backhoe and skimmer combination. Has two skimmer buckets and complete backhoe attachment. Located in Pennsylvania. PRICE way under the market value only #42 ....PRICE $1980.00

e (1) Bay City Model 45 heavy-duty ¾ yd. shovel powered by Hercules 6-cylinder gas engine—completely rebuilt. According to inspector's report looks like a new machine. Located in New England. #43 PRICE $9500.00

e (1) Electric tunnel shovel 20B Bucyrus—has a 35' crane boom and Standard shovel front. Located New York State. #44....PRICE $5250.00

e (1) ¾ yd. Byers Bearcat Crane—Serial number in 3700s—powered by a 6-cylinder Hercules gas engine. Length of boom 30', box type. According to the inspection report, condition of the gears is good and the crawler pads are O.K., cab good. A new transmission has just been installed for the engine. Located—New England. #45....PRICE $4200.00

A real bargain is a ¾ yd. Byers crane which is powered by a 4-cylinder Buda engine, has a steel canopy top and is in operating condition. Located in South Carolina. #46....PRICE $2150.00

One (1) ¾ yd. Byers Model 10—full swing crane—40' lattice type boom—75 H.P. Climax gas engine—¾ yd. clam bucket and dragline attachment. Machine is in fairly good condition. Located in Iowa. #47 PRICE $3700.00

One (1) ¾ yd. Insley crane—30' boom—¾ dipper bucket. Power supplied by a Buda 4-cylinder gas engine. Canopy top—steel cab. Located in South Carolina. #48....PRICE $3550.00

One (1) ¾ yd. Koehring Model 301—gas powered shovel and crane combination. Located Up-State New York. #49....PRICE $4700.00

One (1) Model 301 Koehring Crane with 40' boom—¾ yd. capacity. General condition good with the exception of the tracks which need a certain amount of work. Located in Illinois. #50...PRICE $5900.00

One (1) ⅞ yd. Linkbelt Speeder. Machine is in good working condition. Located Up-State New York. #51 ....PRICE $5660.00

One (1) Lorain 40 Shovel—¾ yd. capacity with crane boom and shovel combination—built in 1937. Located Up-State New York. #52....PRICE on request

One (1) ¾ yd. Marion Model 120 shovel—powered by an International gas engine—has a rock shovel bucket—condition is good. Located Pennsylvania. #54 ....PRICE $5900.00

One (1) ¾ yd. Marion shovel and crane combination —built in 1939—½ yd. clamshell bucket—Rebuilt—Guaranteed. Located New England. #55. PRICE $11900.00

One (1) ¾ yd. Northwest Model 2 shovel front with ¾ yd. dipper bucket—powered by Wisconsin 4-cylinder gas engine. General condition of the machine is good. Gears, motor, cats and cab also good. Just spent considerable amount for overhauling. Located South Carolina. #56....PRICE $6900.00

One (1) Northwest Shovel Model 3—in very good condition. Located in New England. #57 PRICE $6100.00

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Lorain 75-B Shovel and Crane Combination, serial number in 4500s. 75' boom—clamshell bucket. In Excellent condition Located in New England and price is $11,900.00.

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One (1) P & H Model 400 shovel—¾ yd. capacity—Located in South Carolina. #61....PRICE $4400.00

One (1) P & H ¾ yd. backhoe Model 400—real good condition. Powered by 4-cylinder Waukesha engine. Located—New England. #62....PRICE $4100.00

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One (1) P & H Model 400—¾ yd. with 40' boom—rebuilt. Located in New England. #64 PRICE $4750.00

One (1) Sargent ¾ yd. dragline—in real good working condition—power supplied by Twin City 4-cylinder 65 H.P. gas engine. This gas engine has been entirely rebuilt—new pistons and pins and a new complete head. The boom is 36' lattice type—has a ¾ yd. Page dragline bucket. Machine is in good working condition. The gears are good since all the worn gears have been replaced a few months ago—new bushings—boxings, swing and center pinion gears have been supplied. Located Illinois. #65 PRICE ONLY $4700.00

One (1) Bucyrus-Erie Model GA2 crane—45' boom—in rather good operating condition—Located in New Jersey. #66....$4400

Two (2) Bucyrus-Erie Model GA2 shovels—entirely overhauled last year—Located in Michigan—and these units are offered in good running condition for—#67 ....$4300.00 each

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One (1) Bucyrus-Erie Model GA2 1 yd. with 4-cylinder Waukesha gas engine 52' boom lattice type—Located in Wisconsin. #69.... [illegible]

One (1) Byers Model A gasoline shovel and crane combination — entirely reconditioned — located in Pennsylvania. #70....PRICE $7500.00

$2300.00 will buy a 1 yd. Industrial Brownhoist crane with a 60' boom—consisting of 35' and a 25' extension. According to the report, the motor is in good condition. The drive chains for the cats need some attention. Can be inspected any time in Massachusetts. #71 ....PRICE $2300.00

One (1) 1 yd. Koehring shovel and crane combination 45' boom—1 yd. dipper bucket. Located Up-State New York. #72....PRICE $5200.00

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One (1) Model 401 Koehring—1 yd. shovel and crane combination. Serial number in 1400s—6 cylinder Wisconsin motor. Located in Massachusetts. #74 PRICE $8900.00

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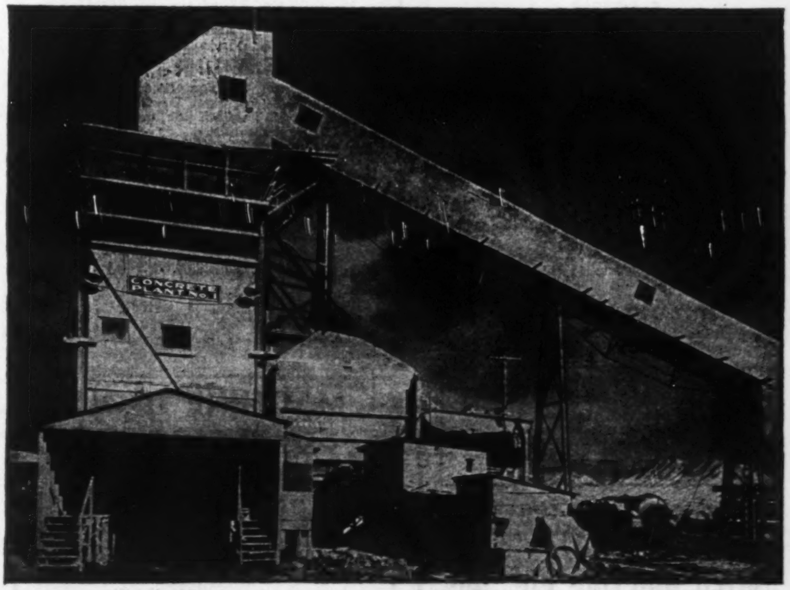

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1—Lambert, powered by 60 H.P. A.C. motor, 6,000 lbs. Line Pull, with swinger
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4—6¼x8 single drum Lambert steam hoists.
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1—Niagara 3′ x 8′, 3 deck, with 5 H.P. motor.
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All with motors 3 phase, 60 cycle, 220-440 volt, and V-belt drives.

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PUMP—Centrifugal, Vertical, Immersion type

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42″	5	1/8″	1/16″	20″	4	1/8″	1/32″
36″	6	1/8″	1/16″	18″	4	1/8″	1/32″
30″	6	1/8″	1/16″	16″	4	1/8″	1/32″
30″	5	1/8″	1/16″	14″	4	1/16″	1/32″
24″	5	1/8″	1/32″	12″	4	1/16″	1/32″
24″	4	1/8″	1/32″				

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18″	6	10″	6	6″	5
16″	6	10″	5	5″	5
14″	6	8″	6	4″	5
12″	6	8″	5	4″	4
12″	5	6″	6	3″	4

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	35 ″	10.50
	40 ″	12.00
	50 ″	15.00
1½″	25 ″	10.00
	35 ″	14.00
	50 ″	20.00

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W-473, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

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W-454, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

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WHEEL PRESS—300 ton capacity

W-453, Eng. News-Record
330 West 42nd St., New York 18, N. Y.

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48" Conveyor equipment for 1200 ft. centers including belting.

Write, giving description, condition, price and location for inspection.

W-478, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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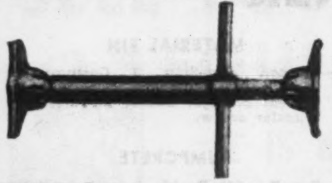

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FS-452, Engineering News-Record
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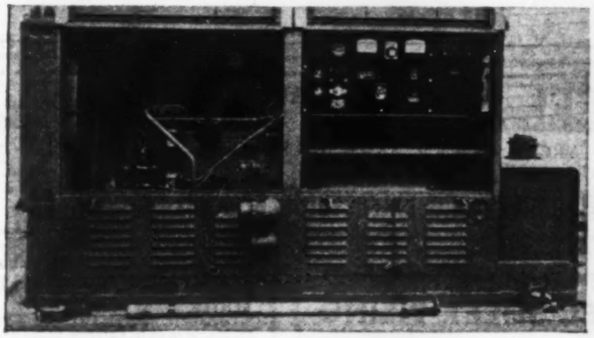

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FS-405, Engineering News-Record
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208 Old Post Office, Knoxville, Tennessee

OFFICIAL PROPOSALS
(Continued from page 158)

Bids: July 6 (257)

Water Works System

NISKAYUNA WATER DISTRICT NO. 6—
NISKAYUNA, NEW YORK

Sealed bids for the construction of water works system will be received in the rooms of the Fire Station on Balltown Road, in the Town of Niskayuna, Schenectady County, New York, until 2:30 P. M. Eastern War Time, July 6th, 1944, and then at said rooms publicly open and read aloud.

The Information for Bidders, Form of Contract, Plans, Specifications, and Form of Performance Bond may be examined at the office of the Town Clerk, Town of Niskayuna, New York, and at the office of Solomon & Keis, Consulting Engineers, 257 Broadway, Troy, New York, copies thereof may be obtained at the said offices of the town clerk, or Solomon & Keis, upon payment of $25.00 for each set. Any bidder upon returning such set in good condition, will be refunded his payment and any non-bidder upon so returning such set promptly will be refunded $20.00.

The Town Board, Niskayuna, New York reserves the right to waive any informalities in, or to reject any, or all bids.

A certified check made payable to the Order of the Supervisor of the Town of Niskayuna, New York, in the amount of five per centum (5%) of the bid must be deposited by each bidder with his bid as a guarantee that in case the contract is awarded to him, that he will within five (5) days thereafter, execute such contract and furnish a satisfactory performance bond. On failure to do so he shall forfeit the deposit as liquidated damages, and acceptance of the bid will be contingent upon the fulfillment of this requirement by the Bidder.

The successful Bidder will be required to furnish a performance bond satisfactory to the Town Board of Niskayuna, New York in the amount of the contract, and having as surety thereon such surety company or companies as are acceptable to the Town Board of Niskayuna, New York.

No Bidder may withdraw his bid within thirty (30) days after the date set for the opening thereof. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof.

ANGUS J. SEAMANS
Town Clerk

Date: June 15th, 1944
Solomon & Keis
Consulting Engineers

Bids: July 17, 1944 (259)

Construction of Well

FLORIDA CITRUS CANNERS COOPERATIVE

Sealed bids for the construction of a well with pumping station and pumping equipment for same, repairs and improvements to existing wells, new pumping equipment as may be determined by tests to be necessary water main extensions and miscellaneous water works improvements will be received at the office of the Florida Citrus Canners Cooperative, Lake Wales, Florida, until 2:00 P. M. Eastern War Time, July 17th, 1944, and then at said office, publicly opened and read aloud.

The Information for Bidders, Form of Contract, Plans, Specifications, and Form of Performance Bond may be examined at the office of Florida Citrus Canners Cooperative, Lake Wales, Florida and at the office of Solomon & Keis, 257 Broadway, Troy, New York, copies thereof may be obtained at the aforesaid offices upon payment of $10.00 for each set. Any bidder upon returning same in good condition will be refunded his payment and any non-bidder upon so returning such set promptly will be refunded $5.00.

The Florida Citrus Canners Cooperative reserves the right to waive any informalities in, or to reject any, or all bids.

A certified check made payable to the order of Florida Citrus Canners Cooperative in the amount of $2000 for Section I and $1000 for Section II must be deposited by each bidder with his bid as a guarantee that in case the contract is awarded to him, that he will within five (5) days thereafter, execute such contract and furnish a satisfactory performance bond. On failure to do so, he shall forfeit the deposit as liquidated damages, and acceptance of the bid will be contingent upon the fulfillment of this requirement by the bidder.

The successful bidder will be required to furnish a performance bond satisfactory to the Florida Citrus Canners Cooperative in the amount of the contract, and having as surety thereon, such surety company or companies as are acceptable to it.

The work will be let in two separate contracts as follows:

SECTION I—The drilling, equipping, repair and improvement of wells with foundations, structures, and housing for well equipment, and all piping within fifteen (15) feet of the well. Also testing of present wells and present pump equipment.

SECTION II—All water main work, elevated tank riser pipes, except pipe work connected to wells and within fifteen feet of wells.

No bidder may withdraw his bid within thirty (30) days after the date set for the opening thereof. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof.

FLORIDA CITRUS CANNERS COOPERATIVE
By
H. S. NORMAN, PRESIDENT

JUNE 29, 1944
Solomon & Keis
Consulting Engineers

Bids: July 6 (258)

Test Borings and Appurtenant Work

BUFFALO SEWER AUTHORITY
BUFFALO 2, NEW YORK

Sealed bids for the making of test borings and appurtenant work in connection with sub-surface investigations for sewer construction projects will be received by the Buffalo Sewer Authority at Room 1038, City Hall, Buffalo 2, New York, until 11:00 o'clock A.M., Eastern War Time, on the 6th day of July, 1944, at which time and place they will be publicly opened and read aloud.

The work comprises a single contract and embraces the following approximate major quantities of work:

Uncased borings in soft ground—400 linear feet

Cased borings in soft ground—1000 linear feet

Rock core borings—250 linear feet

Grouting of holes—5 bbls. of cement

Bids and contract will be made on the basis of unit prices.

Form of proposal, form of contract, plans, specifications, and form of performance surety bond may be obtained at the office of the Buffalo Sewer Authority, Room 1038, City Hall, Buffalo, New York.

The Buffalo Sewer Authority reserves the right to waive any informalities in or to reject any and all bids.

No proposal or bid will be considered unless it is accompanied by a certified check payable to the Buffalo Sewer Authority, for an amount not less than five per cent (5%) of the amount bid for the total aggregate work contemplated to be done, which check shall be duly certified by an incorporated bank or trust company, or, in lieu of such check, a bond running to the Buffalo Sewer Authority, approved as to form by the Corporation Counsel and as to sufficiency by the Comptroller of the City of Buffalo, in the amount of not less than twenty-five per cent (25%) of the amount bid for the total aggregate work contemplated to be done.

BUFFALO SEWER AUTHORITY
(signed) Daniel H. McCarriagher
Chairman

Dated: June 20, 1944
Buffalo, New York

Bids: July 13 (262)

Addition to Plaza Office Building

THE PORT OF NEW YORK AUTHORITY
HOLLAND TUNNEL
NEW JERSEY
ENTRANCE PLAZA

CONTRACT HT-1

Sealed proposals for the above work will be received at the office of the Executive Director of The Port of New York Authority, Number 111 Eighth Avenue, New York 11, N. Y., until 11:00 A. M. on Thursday, July 13, 1944, at which time they will be publicly opened and read in the Auditorium of the Authority at the same address.

Contract documents may be seen at the office of the Chief Engineer, The Port of New York Authority, Room 1538, 111 Eighth Avenue, New York City, and copies will be furnished upon deposit of $5.00 per set. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Frank C. Ferguson,
Chairman.

New York, June 29, 1944.

Bids: July 17 (263)

Improvement of Dam

SCRANTON-SPRING BROOK WATER SERVICE COMPANY
135 Jefferson Avenue
Scranton, Pennsylvania

Bids will be received up to 10 A. M. July 17, 1944 for the improvement of No. 7 Dam near Scranton, Pennsylvania. The work involves about 700 cubic yards of excavation, 1175 cubic yards of compacted earth fill, the removal of about 140 cubic yards of concrete and 560 cubic yards of stone masonry, the placing of about 1500 cubic yards of concrete and stone masonry, and placing of 16 three-inch anchor bolts, 30 feet long, in drilled holes, certain pipe alterations and other miscellaneous work. War Production Board AA-3 Priority. Plans and specifications may be obtained at the office of the Company, 135 Jefferson Avenue, Scranton, Pennsylvania and may be seen at the office of Thos. H. Wiggin, Consulting Engineer, 90 Broad Street, New York, New York. A charge of $5.00 will be made for specifications and drawings.
June 23rd, 1944

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1—**Automatic BRICK MAKING MACHINE,** model 46, Auto Brik Machine, vertical, nine or less U. S. Std. size brick per mold. Operating speed to 25 molds per min. Brick capacity to 13,000 brick per hour. Horse Power to 75, depending upon physical characteristics of the clay or shale. Friction Clutch Pulley 60" diam. by 16" face; speed 10 rev. per mold. Overall dimensions: 18'0" long, 6'6" wide, 13'0" high.

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3520 Ft.—**CONVEYOR,** for carrying bricks loaded on steel pallets. Conveyor consists of two ⅝" wire ropes on about 18" centers, running on two idler sheaves supported on frames about 2 ft. from floor. Driven by 5 H.P. Motors in sections each about 350 ft. long.

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2—General Electric 8 Ton Industrial Locomotives, Nos. 1754 & 1755, 36" gauge, 12 ft. Trolley Pole with Pulley and Harp.

13—Western Wheel Scraper Co. 3-Yard capacity Side Dump Cars, wood, with hand brakes, 36" gauge.

12—Orenstein Koppel 1-Yard capacity all steel Side Dump Cars, 36" gauge.

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2—Lambert Single Drum Gasoline Hoists, drum 20" diam., 21" face, with Buda model WTI Gas Engine, four-cylinder, 3¾" x 5⅛".

1—Caterpillar Model 20 Gasoline Powered Tractor, caterpillar mounted. Belt H.P. 31.16, approx. wgt. 7740 lbs.

1—Flory Single Drum Hoist, drum 15" diam., 25" face, double reduction. For elec. dr.

1—Ingersoll-Rand Class ER1 Air Compressor, size 4" x 4", 28 c.f.m., 500 r.p.m. 150 lbs. pressure max.

1—7½ Ton White Machinery Truck with Power Winch, six-wheel, pneum. tires.

1—Ingersoll-Rand No. 34 Drill Sharpener

1—Ingersoll-Rand Portable Oil Furnace for drill steel, on wheels.

1—Steel Bridge, 28'6" x 66' long.

500 Ft.—Bucket Elevator Conveyor, 17" wide.

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Continued from page 183

PROFESSIONAL SERVICES

Continued from page 183

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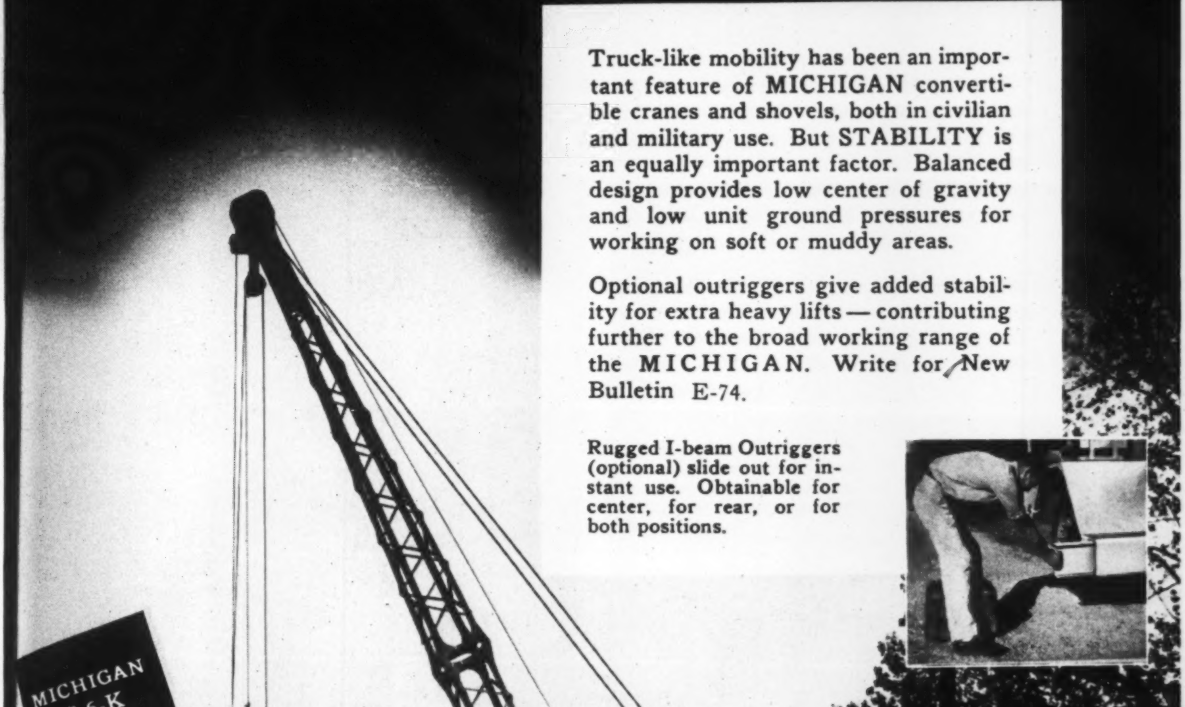

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